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INTRODUCTION

The goal of ensuring that all South Carolinians enjoy clean air is quite a challenge for the South Carolina Department of Health and Environmental Control's (SCDHEC) Air Program. While we continue to appreciate good air quality in South Carolina, changes in federal environmental standards and a growing population challenge our state to maintain clean air.

This year's publication focuses on a review of a decade (1990-2000) in South Carolina's air quality. Looking over the past decade and highlighting significant trends and changes in air quality will help the public understand the positive impact on and the continuous improvement made since 1990. Since the passage of the 1990 Clean Air Act Amendments (CAAA), the Program has played an important role in maintaining attainment of national air quality standards in South Carolina.

Over the past several years, the Program has undergone several organizational changes to better implement the 1990 Clean Air Act Amendments. These changes are highlighted throughout this report.

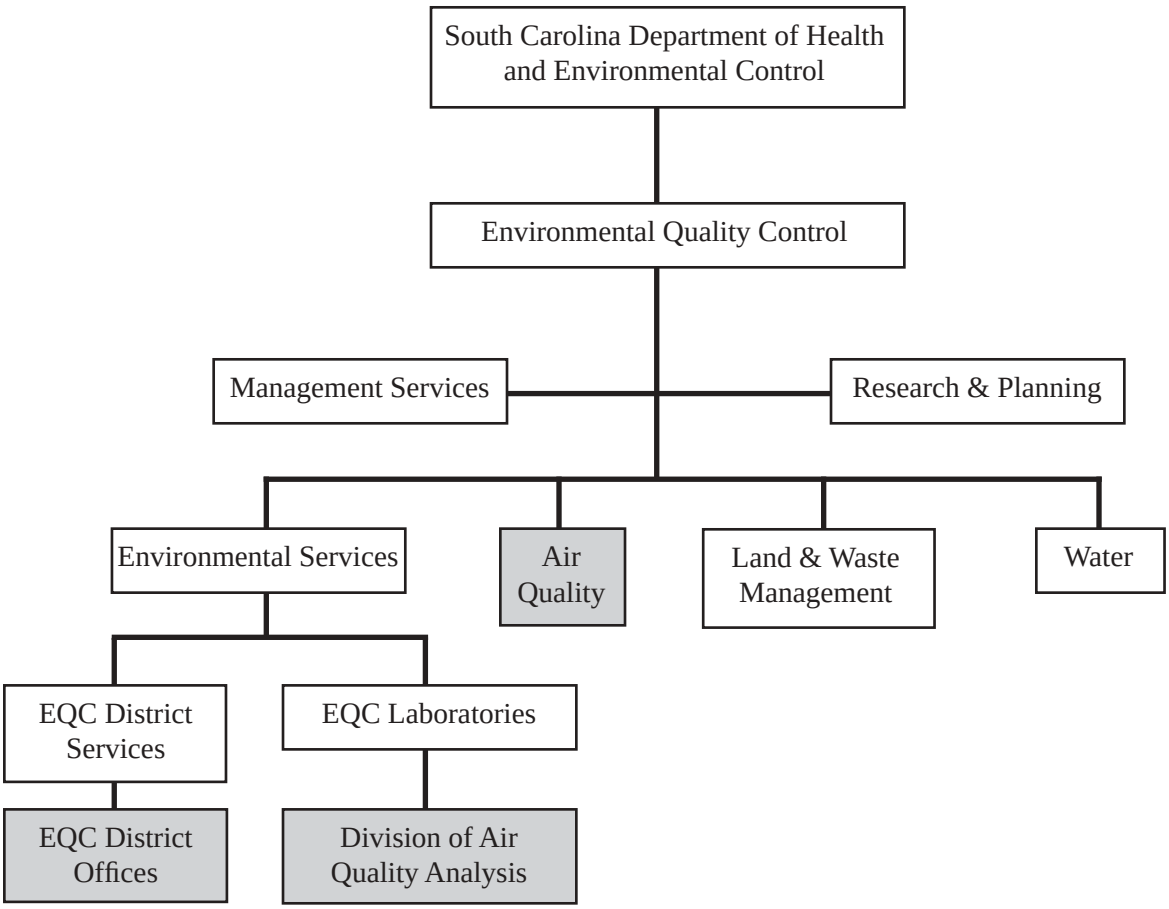
It is also significant to note that budgetary cuts have played an important role during the last decade and forced the Agency to look at a more business-like approach in dealing with regulatory changes. Staff has been innovative in their attitude of "having more to do with less." This report will bear witness that Air Program staff are committed to planning for responsible growth and not jeopardizing the vision of "Healthy People Living in Healthy Communities."

We hope that the information provided in this report will prove useful and serve to generate interest and participation from the public in initiatives to protect the air quality in our State.

Highlights

- Organizational changes made in 1998 to better meet the demands of the Clean Air Act Amendments
- Implementation of a streamlined permitting process (outcome of Restructuring Act in 1993) increased compliance and ensured that resources were used in the most effective manner
- Implementation of the Small Business Assistance Program
- In 1999, General Permits greatly facilitated permit implementation for certain facilities such as concrete, hot mix, asphalt, fuel combustion and textile greige mill plants
- DHEC's 2000-2005 strategic plan
- Promulgation of significant air quality regulations
- Formation of education and outreach activities
- Improved customer service through electronic communication
- Implementation of ground-level ozone forecasting for 3 geographic regions within South Carolina

Organizational Chart



Bureau of Air Quality

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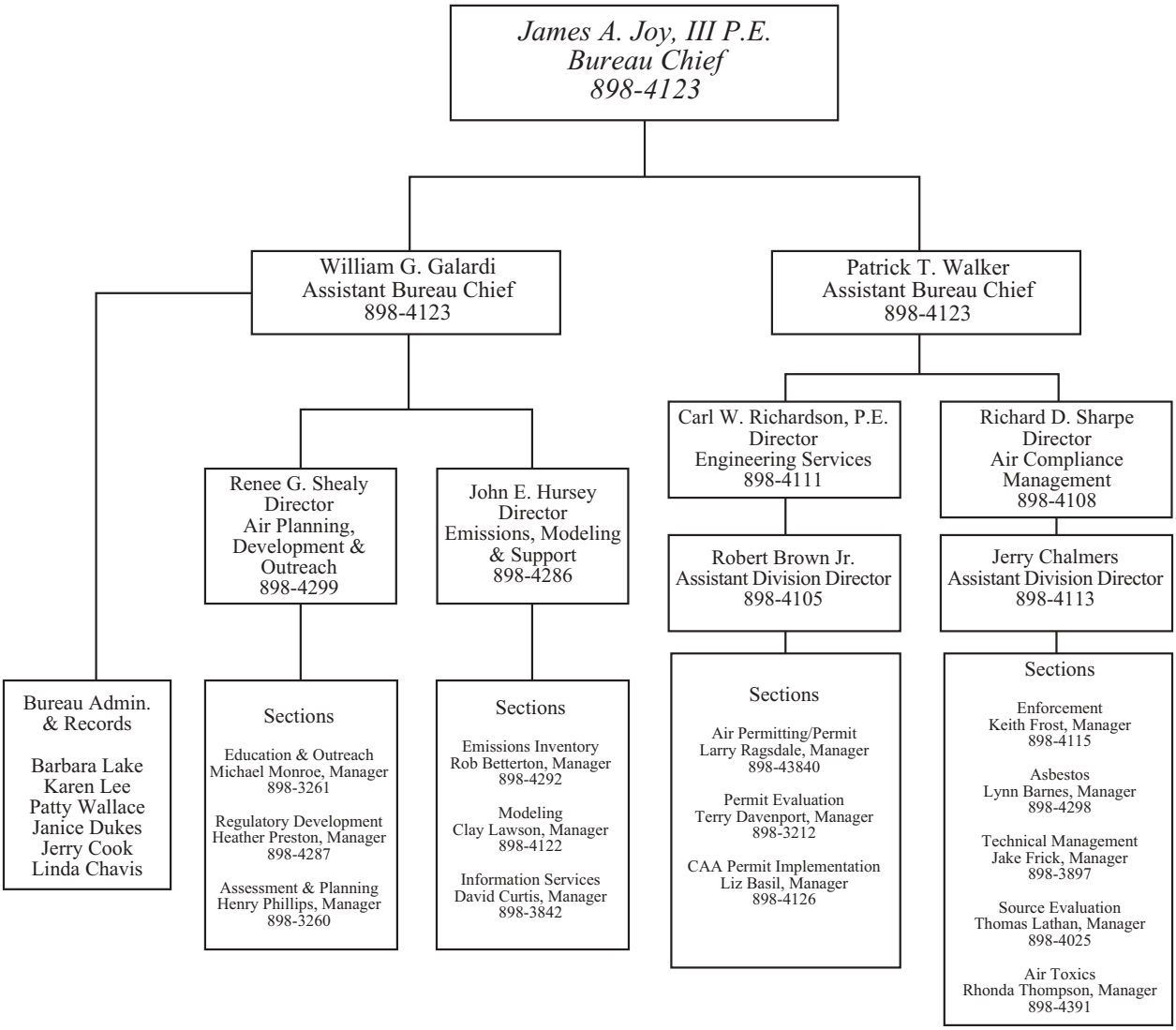


Editors Note: *This organizational chart (Effective Feb. 2002) represents the current BAQ structure.*

D H E C

PROMOTE PROTECT PROSPER

SCDHEC Officials

C. Earl Hunter
Commissioner

R. Lewis Shaw
Deputy Commissioner,
Environmental Quality Control

Board of Health and Environmental Control

Bradford W. Wyche
Chairman

Howard L. Brilliant, M.D.
Charleston

Carl L. Brazell
Columbia

Louisiana W. Wright
Aiken

Mark B. Kent
Greenville

L. Michael Blackmon
Lancaster

Lawerence Chewning, D.M.D.
Florence

***Editor's Note**: For informational purposes, this listing represents the most current commissioner and board members for SCDHEC.*

This change occurred in 2001.

BUREAU OF AIR QUALITY MISSION STATEMENT

To conserve and enhance air resources in a manner that promotes quality of life.

To support this mission, the Bureau of Air Quality, in cooperation with the central office, district, air laboratory and small business assistance program, assures responsible stewardship of air quality and provision of customer service by:

- Assuring the air quality is within the limits prescribed by state and federal laws and defined in permits, licenses, and certifications;
- Monitoring and sampling air pollution sources and the outside air;
- Assessing the impact of environmental emergencies and providing timely response to those emergencies;
- Responding to requests for air quality-related information in a timely manner;
- Administering an inspection and certification program for asbestos renovation and demolition projects;
- Designing and implementing emission control regulations;
- Issuing construction and operating permits for regulated sources of air emissions; and
- Taking enforcement actions when appropriate.

HISTORICAL DEVELOPMENT OF THE AIR QUALITY PROGRAM SINCE 1990

The Clean Air Act (CAA), originally enacted in 1963, revised in 1970 and 1977, and amended in 1990, is a federal law that authorizes the Environmental Protection Agency (EPA) to establish air quality standards to protect public health, including the health of sensitive populations such as asthmatics, children and the elderly. It also authorized the EPA to set limits that protect public welfare, including protection against decreased visibility and damage to vegetation and materials. Under this Act, the EPA sets nationwide limits on air pollutant concentrations. Its nationwide applicability ensures that Americans living in all areas of the country may expect the same basic protection in regards to their health and the environment in which they live. Individual states can impose state regulations that are more stringent than the federal limits. Air quality has continued to improve during the past 10 years for all six criteria pollutants. In fact, all the years in the 1990s have had better air quality than all the years in the 1980s, demonstrating a steady trend of improvement.

Several key organizational changes have been made over the past decade that could be identified as direct contributing factors to the steady improvement of air quality.

The Bureau established a district liaison in 1992 to act as a facilitator between the Bureau and district air staff. The district liaison is in charge of promoting consistency, accuracy and completeness of district air personnel activities.

The Modeling Section was established in 1990. Before a facility is issued a construction permit, it is modeled to make sure that sources that emit regulated air pollutants can comply with Regulation 61-62.5, Standard 8, Toxic Air Pollutants (approved in June 1991). This section later expanded to include modeling at operating permit renewal dates, ozone forecasting and recently, ozone modeling.

To more effectively regulate asbestos, more emphasis has been placed on public awareness of asbestos management and increased abatement training with contractors.

The Air Toxics Section was created in 1997 to address the Environmental Protection Agency's risk management program. This section has since expanded to encompass Maximum Achievable Control Technology (MACT) Regulations.

In 1998, the Bureau reorganized and out of that process, the Division of Air Planning, Development and Outreach was established. It is comprised of three sections: Air Assessment and Planning, Regulatory Development, and Air Education and Outreach. One of the primary functions of this Division is to develop and implement strategies to maintain the quality of South Carolina’s air.

REGULATORY HISTORY

Introduction

The Clean Air Act Amendments of 1990 brought many changes to the air program that continued throughout the 1990s. These changes included new programs, new initiatives and revamped existing programs. During the late 1990s, new programs initiated by the EPA brought changes that are still being addressed today.

This section of the Annual Report summarizes some of the important changes brought about by the 1990 Clean Air Act Amendments and EPA initiatives. These summaries are intended to give you a quick overview of several of our most important programs. As you will see, regulatory development is an ongoing process.

Title V Operating Permit Program

State Regulations provide the basis for the Bureau permitting system. On July 26, 1995, South Carolina received delegation of authority by the EPA to implement the Title V Operating Permit Program codified in South Carolina Regulation 61-62.70. The purpose of the Title V Operating Permit Program is to provide a comprehensive air quality operating permit for all major sources of air contaminants. The Title V Operating Permit Program applies to any major facility defined as having the potential for uncontrolled emissions of 100 tons per year (tpy) or more, or that has the potential for uncontrolled emissions of any one hazardous air pollutant (HAP) of 10 tons per year or more, or any combination of hazardous air pollutants totaling 25 tons per year or more.

Since the Title V Operating Permit Program was initiated in 1995, the Bureau Permitting Section has issued 280 Title V permits. These permits represent 94% of the 299 Title V sources in South Carolina.

NESHAPs and MACT Standards

The 1970 Clean Air Act required the EPA to set emissions standards (that is, limits on how much of a pollutant could be emitted into the air by a source) for pollutants that can cause serious or irreversible health effects. Standards for these hazardous pollutants were to be "health-based" standards. In other words, the EPA was to establish a numerical limit that would protect human health from any adverse effects. Setting health-based standards is a difficult process because of the uncertainty in assessing health effects. As a result, health-based standards have been set for only eight pollutants. Standards for these pollutants are referred to as National Emissions Standards for Hazardous Air Pollutants (NESHAPs).

The 1990 Clean Air Act Amendments established a new approach for regulating hazardous air pollutants. In revising the Clean Air Act, Congress specifically listed 189 compounds as hazardous air pollutants (one pollutant, caprolactum, was subsequently dropped from the list, but South Carolina elected to retain it). The EPA was directed to develop technology-based Maximum Achievable Control Technology Standards for all these pollutants. This list includes pollutants that are known or suspected to cause cancer and other adverse health effects. In 1992, the EPA published an initial list of source categories for which air toxics emission standards are to be promulgated and, based on the list, began developing rules that require maximum achievable control technology, considering cost and other factors.

In 1995, the EPA delegated authority to South Carolina to implement the Maximum Achievable Control Technology Standards as they became effective. Since that time, SCDHEC has been updating the state regulations to incorporate new Maximum Achievable Control Technology Standards about once a year. Between 1990 and 2000, the EPA promulgated approximately 50 Maximum Achievable Control Technology Standards.

8-hour Ozone Standard

In July 1997, the EPA promulgated an 8-hour ozone standard to replace the 1-hour standard. This new standard was more stringent than the 1-hour ozone standard. Under the 8-hour standard, a violation occurs when the three-year average of the fourth highest daily maximum 8-hour average exceeds 0.08 ppm. The new standard was challenged and the U.S. Court of Appeals for the D.C. Circuit remanded the 8-hour ozone standard and issued an opinion limiting the manner in which the EPA could implement it. The EPA appealed this decision to the U.S. Supreme Court.

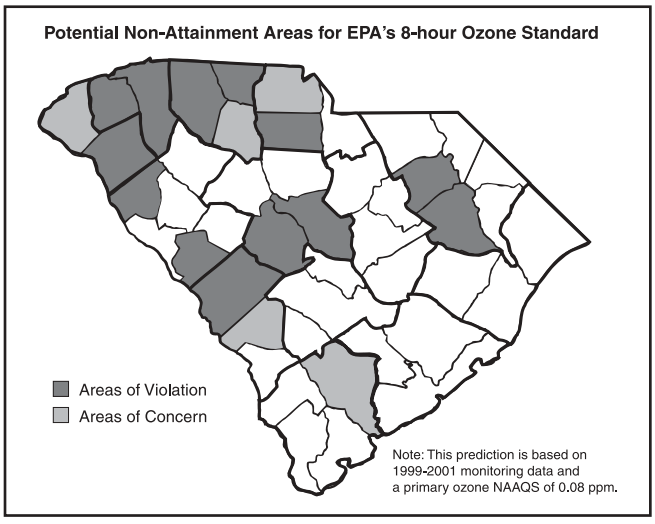
According to the EPA guidance, areas with monitors showing violations of the 8-hour level during the 1997-1999 seasons would be designated as non-attainment. In addition, EPA suggested that surrounding counties

contributing to those violations should be included in the non-attainment area. States could suggest attainment and/or non-attainment boundaries by providing rationale for those boundaries. In accordance with the EPA requirements, South Carolina submitted a response package to the EPA in June 2000.

South Carolina's assessment of the EPA's proposed process concluded that areas where our ozone monitors indicate exceedances should be designated as non-attainment.

All areas of South Carolina are currently in attainment with the 1-hour standard. In fact, South Carolina is currently only one of 15 states meeting all the National Ambient Air Quality Standards. However, many areas of the state have monitors showing violations of the more stringent 8-hour level. According to the EPA guidance, areas with monitors showing violations of the 8-hour standard will be designated as non-attainment.

There has been a great deal of controversy surrounding the 8-hour ozone standard. In May 1999, the U.S. Court of Appeals for the D.C. Circuit remanded the 8-hour standard and issued an opinion limiting the manner in which the EPA can implement it. The case was then brought before the U.S. Supreme Court and on February 27, 2001, the Supreme Court issued a ruling relating to the May 1999 decision by the D.C. Circuit Court. The Supreme Court ruling affirmed in part and reversed in part the judgment of the D.C. Circuit Court, and remanded the case for further proceedings. One issue that the Supreme Court remanded concerns the implementation issue. The Supreme Court said that the EPA must reconsider its implementation plan for moving from the 1-hour standard to the 8-hour standard. However, the Supreme Court upheld EPA's ability to set or revise air quality standards.



The EPA is expected to publish its final implementation guidance by late 2003. Areas are expected to be designated for the 8-hour ozone standard in 2004.

Risk Management Program 112(r) – Accidental Release Prevention Program

The 112(r) Risk Management Program builds upon other laws and programs that focus on emergency response and preparedness. The program ensures all affected facilities have programs in place to prevent accidental chemical air releases. These programs may include written procedures, operator training, preventive maintenance, and drills. The program's goal is to prevent harm to the public and environment and to minimize consequences if releases do occur.

The Risk Management Program became effective August 28, 1998. Over 200 facilities in South Carolina are covered. The Bureau ensures compliance by conducting periodic site inspections; auditing records; and having discussions with plant operators, officials and local emergency response personnel.

NO_x SIP Call

On October 27, 1998, the EPA finalized a Nitrogen Oxides (NO_X) State Implementation Plan (SIP) Call Rule. This final rule, commonly referred to as the NO_X SIP Call, requires reductions of NO_X emissions from sources in South Carolina and comparable reductions from numerous other states. According to the EPA, the purpose of the rule is to reduce the regional transport of ground-level ozone through reductions in NO_X. NO_X is one of the precursors of ozone pollution and the EPA believes that NO_X emitted from sources in South Carolina and certain other states "significantly contributes" to non-attainment of the 1-hour national standard for ozone in "downwind" states.

While some states like South Carolina have successfully met the 1-hour ozone standard, many states have not. This is particularly true in the Northeast. These states believe that they will never be able to achieve the ozone standard without significant reductions in the amount of ozone, or the precursors of ozone, that are transported into their states from "upwind" states.

South Carolina and several other states disagreed with the EPA's findings under this rule and appealed the EPA's action to appropriate federal courts. SCDHEC's position has been that it is improbable that sources within South Carolina significantly contribute to the non-attainment problems in other areas.

On March 3, 2000, the U.S. Court of Appeals for the D.C. Circuit ruled on the litigation. In its decision, the court largely upheld the EPA's position, and directed the states affected by the EPA's NO_X State Implementation Plan Call to submit appropriate revisions to their State Implementation Plans. In light of this court decision, SCDHEC continued to meet with the regulated community to prepare a regulatory plan.

South Carolina's NO_X State Implementation Plan Call Regulations were approved by the State Legislature and became effective on May 24, 2002. The EPA gave final approval to the plan in a notice published in the *Federal Register* on June 28, 2002. In accordance with this plan, certain sources in South Carolina will be required to reduce their NO_X emissions during the ground-level ozone season starting in 2004.

SOUTH CAROLINA'S AIR QUALITY STATUS

Air is a part of the environment we all have contact with. Materials in the air, from pollen to pollution, impact us directly through the air we breathe and indirectly by impacting the quality of our land and water resources. For the past decade, South Carolina has met all national air quality standards. Since we have enjoyed such good air quality for so long, most South Carolinians do not consider what it means to meet these standards.

With the passage of more stringent air regulations comes constant challenges for industry to limit or reduce their emissions. Health effects of air pollution can vary depending on the concentration level, duration and the pollutant. Air pollution is also harmful to the environment. Specific environmental effects of air pollution include damage to vegetation; reduced crop yields; increased corrosion of metals; and deterioration of stone and paint on buildings, cars and cultural landmarks.

Ultimately, air pollution could have economic effects on South Carolina. Our state is well-known for beautiful landscapes. Many visitors cross our borders each year and support the tourism industry. We want to be certain these natural resources are preserved so that tourists will continue to make South Carolina a destination of choice. Furthermore, failing to meet air quality standards could make it difficult to attract new industry to the state, resulting in reduced investment and employment opportunities.

AIR QUALITY MONITORING NETWORK

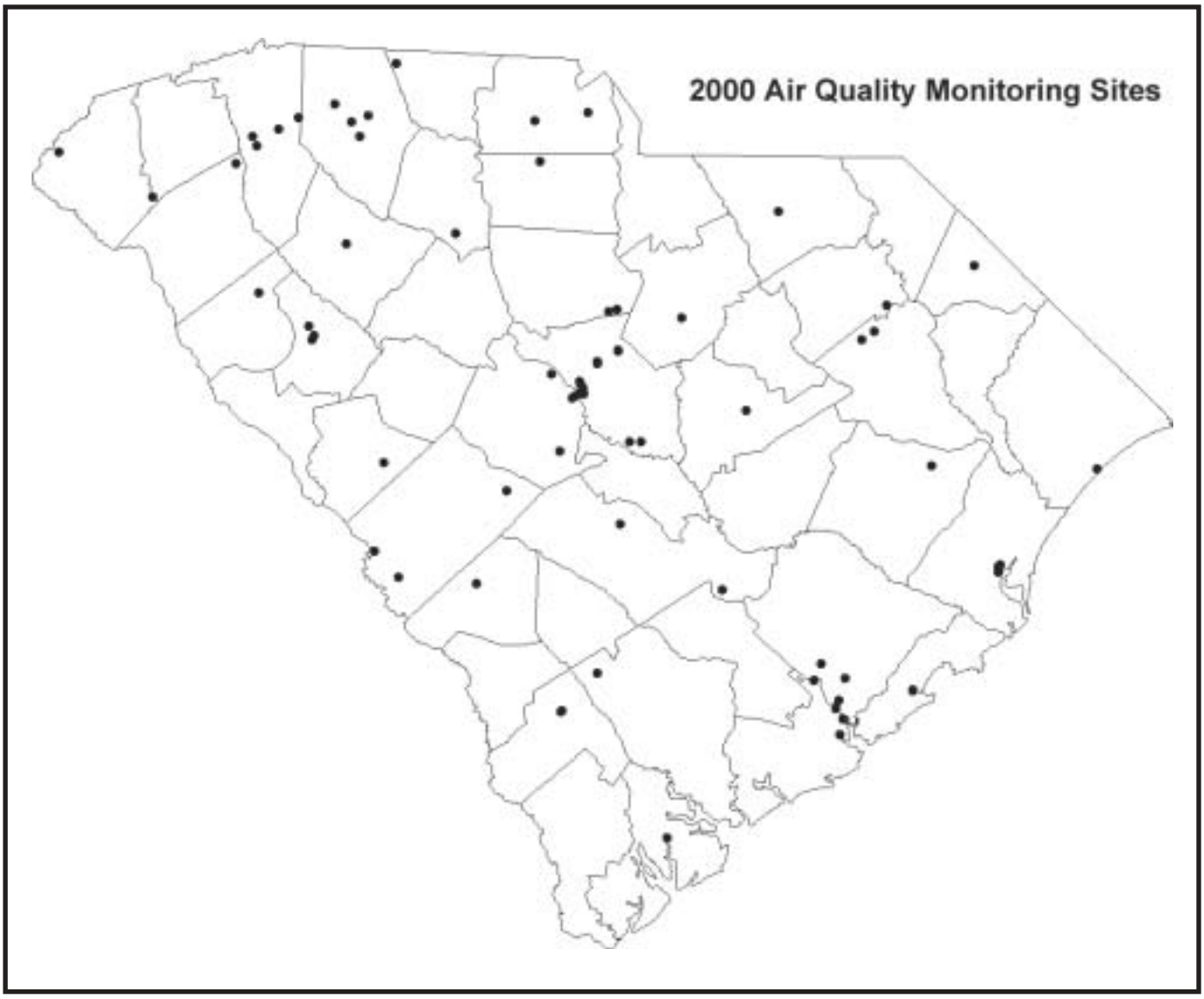
South Carolina operates a network of samplers and monitors to measure the concentrations of primary pollutants and other compounds that impact air quality. In 1990, there were 110 samplers and monitors at 74 sites that measured and tracked the quality of our air. In 2000, there were 144 samplers and monitors at 69 sites. Selecting monitoring sites is a joint decision between the EPA and the Bureau of Air Quality. Any sampling network that monitors air quality needs to provide information that answers several questions:

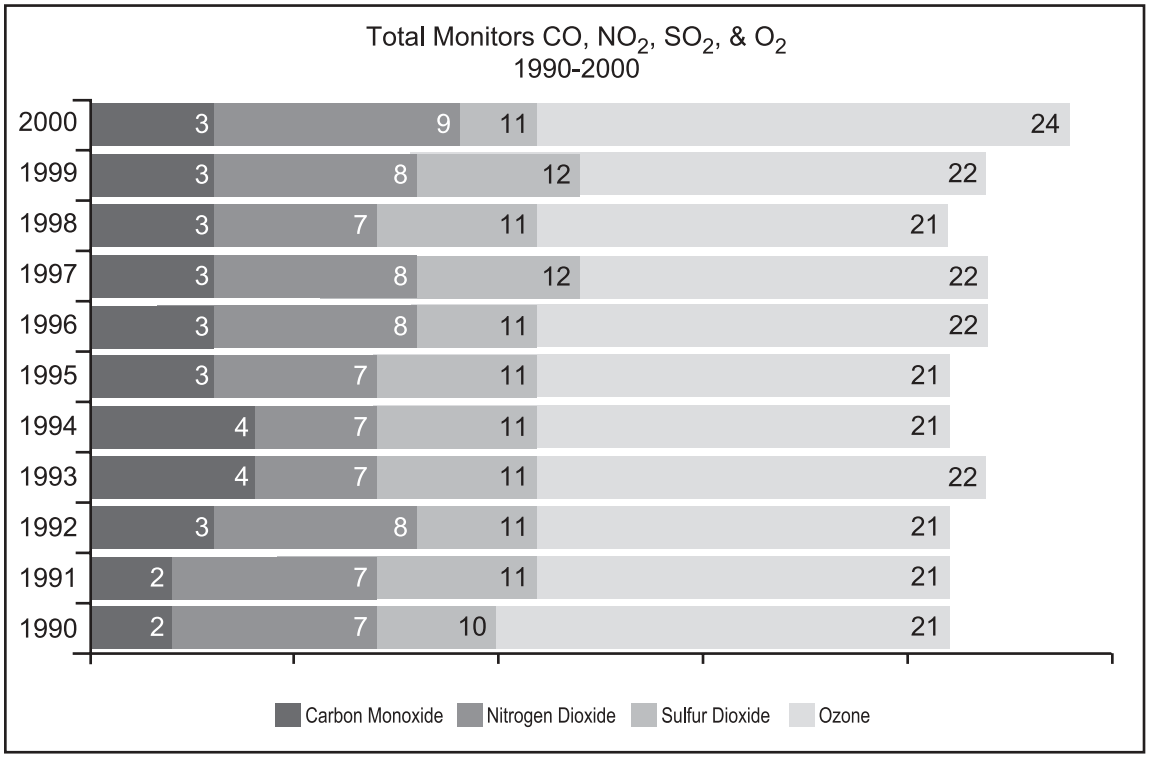
- **What are the pollutant concentrations where people live?** Much of the monitoring takes place in and around urban areas where there are the most people and greatest number of air pollution sources. However, monitors are also placed in rural and agricultural areas to track how pollution impacts people across the state.
- **What is the impact of a specific source or category of sources?** Some monitoring takes place at sites where the sources of air pollution are expected to have the greatest impact.
- **What are the background concentrations?** The pollutant concentrations in areas where there are few sources or are close to pristine provide a baseline for data collected over the rest of the network. This data also provides information about the long-range transport of pollutants.

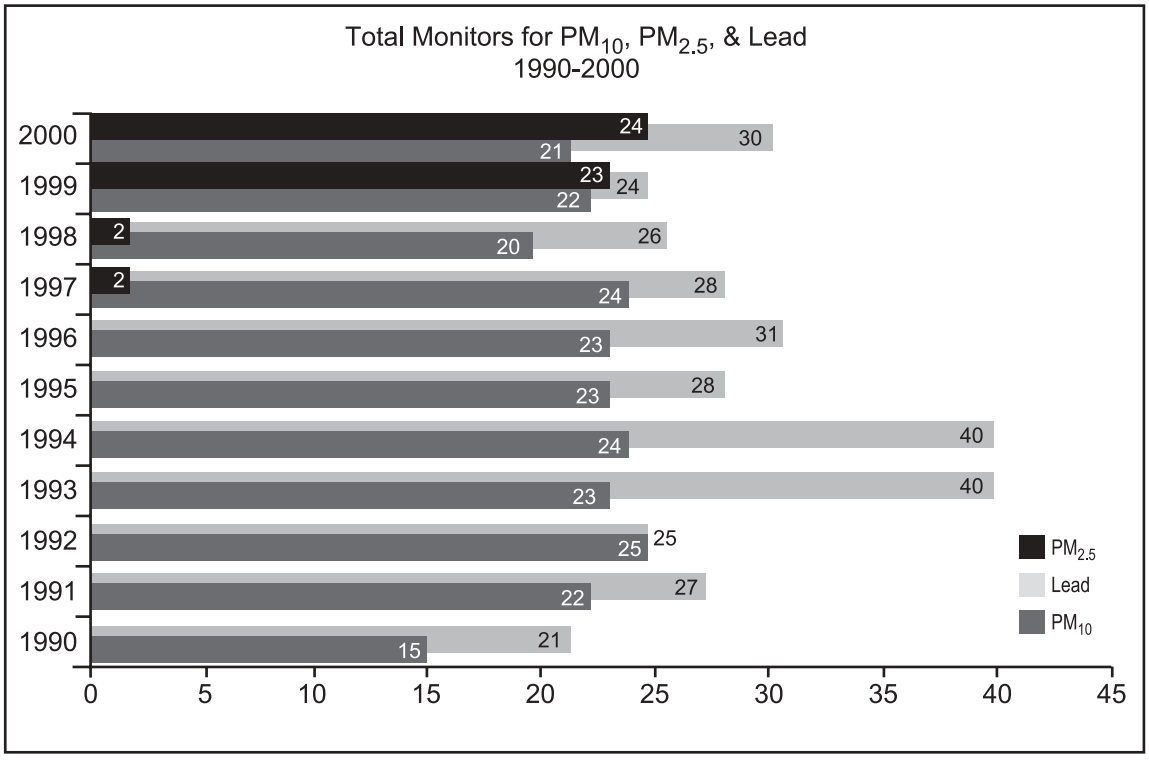
Each site and monitor or sampler that is part of the network collects data that is intended to be representative of the pollutant concentrations over a certain area. This is the scale of the monitor. These range from a microscale for pollutant concentrations that change significantly over small distances (less than 100 meters) to a regional scale where concentrations are fairly consistent for 40 kilometers or more.

The combination of scale and distribution of the samplers describes the representativeness of the monitoring data, or the confidence that the data adequately represents those areas where there is no monitoring. Monitoring data not only needs to be representative across the state, but throughout the year. To make decisions based on the data, we must be confident that highs and lows have been accounted for and that the data is not biased. The quality of the data is assured through regular evaluations that include calibrations and audits of the equipment, co-located samplers, redundant data acquisition, and additional audits by independent sources.

After quality assurance is complete, all data is put into the EPA's Aerometric Information Retrieval System (AIRS), a national database. Data that is of uncertain quality is not used. In general, 75% of the data must be available to adequately represent the pollution concentration at a site. This data can be accessed at www.epa.gov/airsdata. Appendix A contains summary monitoring data for 2000, including percent data completeness by monitor and parameter.


2000 Air Quality Monitoring Sites


Total Monitors CO, NO2, SO2, & O2
1990-2000
2000 3 9 11 24
1999 3 8 12 22
1998 3 7 11 21
1997 3 8 12 22
1996 3 8 11 22
1995 3 7 11 21
1994 4 7 11 21
1993 4 7 11 22
1992 3 8 11 21
1991 2 7 11 21
1990 2 7 10 21
Carbon Monoxide
Nitrogen Dioxide
Sulfur Dioxide
Ozone


Total Monitors for PM10, PM2.5, & Lead
1990-2000
2000 24 21 30
1999 23 22 24
1998 2 20 26
1997 2 24 28
1996 23 31
1995 23 28
1994 24 40
1993 23 40
1992 25 25
1991 22 27
1990 15 21
0 5 10 15 20 25 30 35 40 45
PM2.5
Lead
PM10

NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS)

As previously mentioned, the EPA is responsible for setting National Ambient Air Quality Standards for pollutants considered harmful to public health and the environment. The Clean Air Act established two types of national air quality standards. Primary standards are established to protect public health of sensitive populations such as asthmatics, children and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation and buildings. The six principal pollutants for which there are National Ambient Air Quality Standards are often referred to as "criteria pollutants" and include ozone (O_3), lead (Pb), particulate matter (PM_{10} or $PM_{2.5}$), sulfur dioxide (SO_2), nitrogen oxides (NO_X), and carbon monoxide (CO). These pollutants are described and discussed in the following pages. The purpose of these standards is to establish the concentrations that are protective of the public. In states with areas that exceed any of these standards, the area can be designated non-attainment for that particular standard. South Carolina currently meets, and has met since the early 1990s, all national ambient air quality standards.

Each year, the EPA examines changes in levels of these pollutants over time and summarizes the current air pollution status.

Even with the increased population and industrial growth, there has been no significant increase in any of the six criteria pollutants.

1 GROUND LEVEL OZONE (O_3)

Nature and Sources of the Pollutant

Ozone is a colorless, nearly odorless, toxic gas. In the upper atmosphere (stratosphere), ozone protects us from the sun's damaging ultraviolet light, but at ground level, ozone is unhealthy. Ground-level ozone is formed by a reaction between volatile organic compounds (VOCs) and oxides of nitrogen (NO_X) when they are exposed to ultraviolet light (in sunlight). NO_X is emitted from a variety of sources, including motor vehicles, chemical plants, refineries, factories, consumer and commercial products and other industrial sources. While ozone occurs naturally in the stratosphere and provides a protective layer high above the Earth, sunlight "cooks" VOCs and NO_X, creating ground-level ozone.

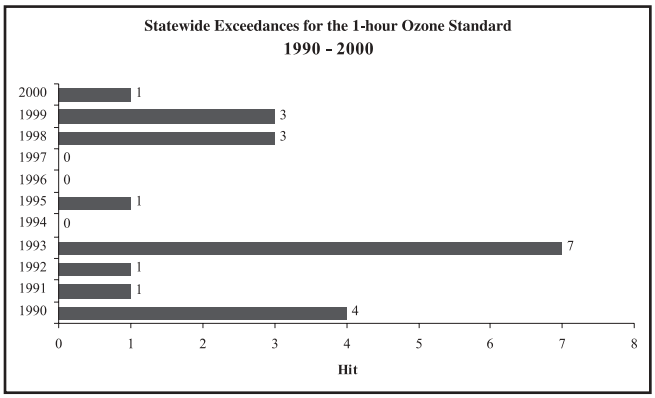
Health and Environmental Effects

Short term (1 to 3 hours) and prolonged (6 to 8 hours) exposure to ambient ozone has been linked to a number of health effects. For example, for people who are more susceptible to respiratory infections, exposure to ozone can result in lung inflammation and can also aggravate pre-existing respiratory diseases such as asthma, emphysema and bronchitis. Increased hospital admissions and emergency room visits for respiratory problems have been associated with ambient ozone exposures. These health effects generally occur while people are working, exercising or playing outdoors. Children who are active outdoors during the summer when ozone levels are at their highest are most at risk of experiencing such effects. Longer-term exposure to moderate levels of ozone present possible irreversible changes in the lung structure which could lead to premature aging of the lungs and worsen chronic respiratory illnesses.

Ozone also affects vegetation and ecosystems, leading to reductions in agricultural and commercial forest yields, and reduced growth and survivability of tree seedlings. Ground-level ozone damage to the foliage of trees and other plants can also decrease the aesthetic value of ornamental species, as well as the natural beauty of our parks and recreation areas.

Even though the EPA revised the proposed ozone standard of 1 hour to 8 hours in 1997, South Carolina is voluntarily collecting data at this time.

Trends in Ozone Levels



Until the 8-hour standard is finalized, there is only one national standard for ozone, and it covers both primary and secondary concerns. The ozone standard is 0.12 ppm averaged over a one hour time period. During the past ten years, there have been several exceedances of the level of the standard itself; however, during that time no single monitoring site has recorded four or more exceedances in a consecutive three-year period, so no violation of the standard has occurred.

1997: EPA revised the national ambient air quality standards for ozone by setting new 8-hour 0.08 ppm standards to better reflect ozone health studies

1998: NO_x SIP Call

1999: The Central Savannah region of Georgia and South Carolina was added as the third geographic region for ground-level ozone forecasting

TIMELINE

2 PARTICULATE MATTER (PM)

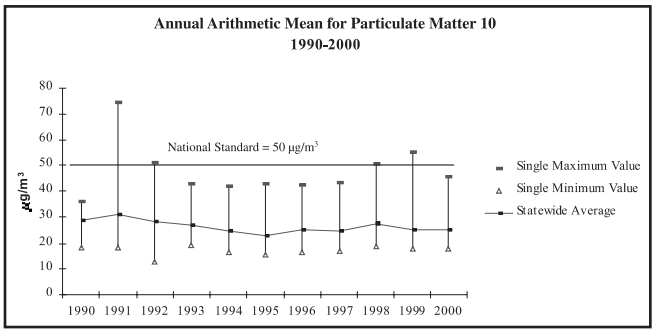
Nature and Sources of the Pollutant

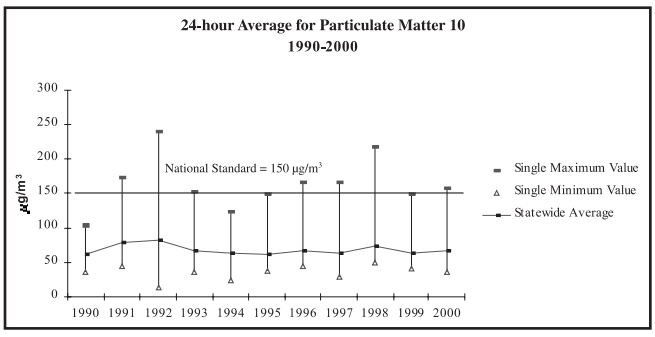
Particulate matter (PM) is the general term used for a mixture of solid particles and liquid droplets found in the air. Some particles are large or dark enough to be seen as soot or smoke, while others are so small they can be detected only with an electron microscope. There are two standards for particulate matter. PM_{10} is referred to as particles with a diameter of ten microns (a micron is one-millionth of a meter) or less. One thousand particles of this size could fit into the period at the end of this sentence. PM_{10}, also referred to as "coarse particulate," is composed largely of primary particles. It comes from a wide variety of stationary, mobile, and natural sources. For example, power production, cement manufacturing, combustion sources, fireplaces, diesel trucks, and forest fires are all sources of particulate emissions. In 1997, the EPA revised the PM standard by adding an indicator for $PM_{2.5}$. $PM_{2.5}$ is referred to as particles with a diameter of 2.5 microns or less. In comparison, human hair has a diameter of seventy microns. $PM_{2.5}$, also referred to as "fine particulate," is composed mostly of secondary particles, and also comes from the same sources as PM_{10}. The chemical composition of particles depends on location, time of year, and weather.

Health and Environmental Effects

Particulate matter includes both coarse and fine particles. When breathed, particles can accumulate in the respiratory system and are associated with numerous health effects. Exposure to coarse particles is primarily associated with the aggravation of respiratory conditions, such as asthma. Fine particles are most closely associated with such health effects as increased hospital admissions and emergency room visits for heart and lung disease, increased respiratory disease and symptoms such as asthma, decreased lung function, and even premature death. Sensitive people that appear to be at the greatest risk to these effects include the elderly, individuals with cardiopulmonary disease such as asthma, and children. In addition to these reported health effects, particulate matter is the major cause of reduced visibility. Airborne particles can also impact vegetation and ecosystems, and can cause damage to paints and building materials.

Trends in PM_{10} Levels





1997: EPA revised national air quality standards. The PM standard added an indicator for $PM_{2.5}$ to strengthen protection against smaller particles. Only limited data has been collected.

There are two national standards for PM_{10}. Each standard covers both primary and secondary concerns. One is an annual arithmetic mean of 50 µg/m^3 and the other is a 24-hour average of 150 µg/m^3. The annual arithmetic mean is used to look at long-term concentrations in the ambient air, while the 24-hour standard is set to measure short-term concentration levels. Any short-term spikes in ambient concentrations are likely attributable to a source-specific event and thus, are immediately corrected.

During the past ten years, the single site maximum annual arithmetic means have ranged from a low of 35.7 µg/m^3 in 1990 to a high of 74.5 µg/m^3 in 1991. Measurements above the standard did not cause the location to be in violation since none of the sites average above the standard for the year. The statewide average values ranged from 23 µg/m^3 to 30 µg/m^3, which has been consistent for the past decade.

Short term exposure to PM_{10} is represented by a 24-hour measurement and longer exposures by an annual average of the daily measurements. For PM_{10} the primary and secondary standards are the same, set at a maximum of 150 µg/m^3 for any day and an average of 50 µg/m^3 over the year. The standards are designed to take into account unusual occurrences by averaging the high concentrations over three years.

The daily concentrations of particulate are based on the average concentration measured over 24 hours, midnight to midnight. It is rare that any concentrations are measured over the standard of 150 µg/m^3. On occasions where high concentrations have been detected, these are often associated with unusual conditions (for example, smoke associated with a wildfire, or dry and windy weather) and the measured concentration is several times the next highest recorded measurement. In those areas where high concentrations have occurred more often, SC DHEC has worked with local facilities and governments to lower concentrations and avoid violating the standard.

The concentration of PM_{10} has generally been consistent from year to year, but there does appear to be a slight decrease in the average concentrations. These occur on both the cleanest and dirtiest days over the last ten years.

Though the EPA promulgated the new $PM_{2.5}$ standard in 1997, they are not expected to designate areas as attainment or non-attainment for the standard until December 15, 2004. The delay in implementation is due to the fact that areas need to collect three years of monitoring data on which to base the designations.

3 NITROGEN DIOXIDE (NO_2)

Nature and Sources of Pollutant

Nitrogen Dioxide (NO_2) is a reddish-brown, highly reactive gas that is formed in the ambient air through the oxidation of nitric oxide (NO). Nitrogen Oxides (NO_X) is the term used to describe the sum of NO, NO_2, and other oxides of nitrogen. They play a major role in the formation of ozone, particulate matter, haze and acid rain. The major source of man-made NO_X emissions is the high temperature combusion process of automobiles, trucks and power plants. Home heaters and gas stoves can also produce substantial amounts of NO_2 indoors.

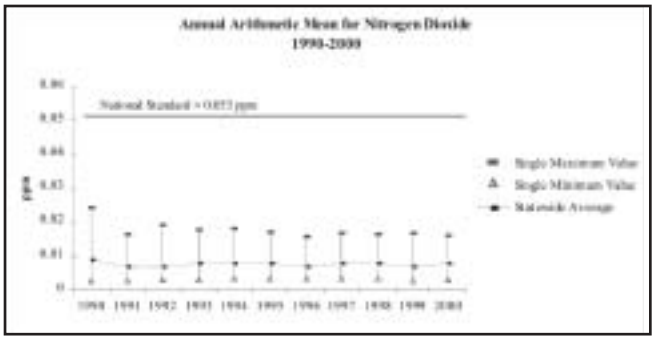
Health and Environmental Effects

Short-term exposure (less than 3 hours) to low levels of NO_2 may impede lung function in people with pre-existing respiratory illnesses and increases in respiratory illnesses in children ages 5-12 years. Long-term exposure may lead to increased susceptibility to respiratory infections and may cause lung disease. NO_2 may also contribute to the aggravation of heart disease. Nitrogen oxides react in the air to form ground-level ozone and fine particle pollution, which are both associated with adverse health effects.

The major environmental effect is the formation of acid rain. Acid rain is harmful to some species of vegetation, fish and other aquatic life. It also contributes to the corrosion of statues and monuments.

By itself, the effects of NO_2 are more of a chronic concern; however, the short term mixing of NO_2 with VOCs can lead to the formation of ground-level ozone.

Trends in NO_2 Levels



There is only one national standard for nitrogen dioxide (NO_2). It covers both primary and secondary concerns. The NO_2 standard is an Annual Arithmetic Mean (AAM) of 0.053 ppm. During the past ten years, the statewide average values remained in the range of 0.007 ppm to 0.009 ppm. South Carolina is well below the national standard for NO_2.

1994: Implementation of Acid Rain Program

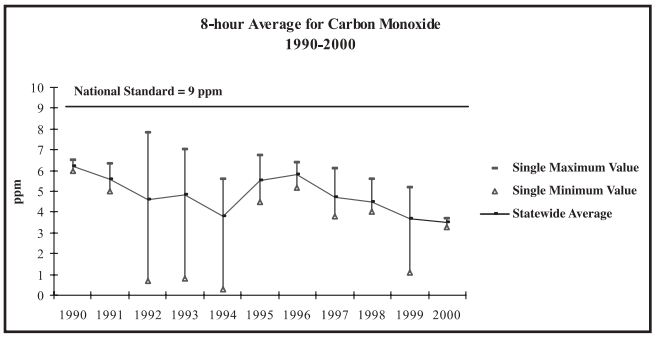
4 CARBON MONOXIDE (CO)

Nature and Sources of the Pollutant

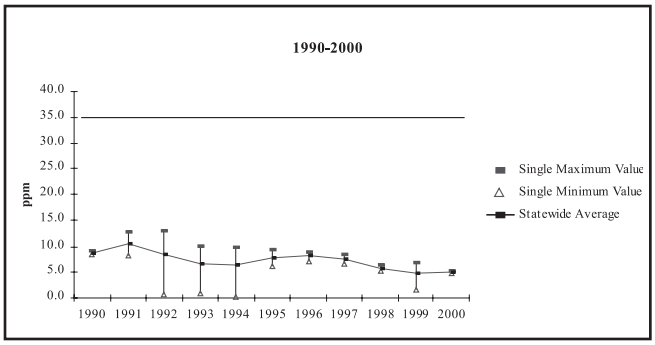
Carbon monoxide (CO) is a colorless and odorless gas which is formed when carbon in fuel is not completely burned. It is the component of motor vehicle exhaust which constitutes about 60% of all CO emissions nationwide. High concentrations of CO emissions may come from larger cities where heavy traffic occurs. Other sources of CO emissions include industrial processes, non- transportation fuel combustion and natural sources, such as wildfires. Peak CO concentrations occur more frequently during the colder months, when CO emissions are trapped near the ground beneath a layer of warm air.

Health and Environmental Effects

CO enters the bloodstream through the lungs and reduces the amount of oxygen delivered to the body's organs and tissue. The most serious health effect to people who suffer from cardiovascular disease is elevated CO levels. Higher levels of CO exposure can be poisonous and even healthy people may be affected. Visual impairment, reduced work capacity, reduced manual dexterity, poor learning ability and difficulty in performing complex tasks are all associated with high CO level exposure.



Trends in CO Levels



There are two primary national standards for CO. The standards are an 8-hour average of 9 ppm and a 1-hour average of 35 ppm. The 8-hour standard is used to look at the lingering quantities of CO in the ambient air while the 1-hour standard measures the acute presence of CO. For South Carolina, CO emissions have not been a major concern, due to both the meteorological and topographical factors prevalent in our state. There is no secondary national standard for CO.

During the past ten years, the statewide average concentrations for the 8-hour standard have ranged from a high of 6.2 ppm in 1990 to a low of 3.5 ppm in 2000. The trend has been decreasing over the last ten years. Also, during the same ten-year period, the statewide average concentrations for the 1-hour standard have ranged from a low of 4.9 ppm in 1999 to a high of 10.6 ppm in 1991. Overall, CO emissions decreased steadily during the last ten years due in part to more efficient combustion practices from both industry and mobile sources.

5 LEAD (Pb)

Nature and Sources of the Pollutant

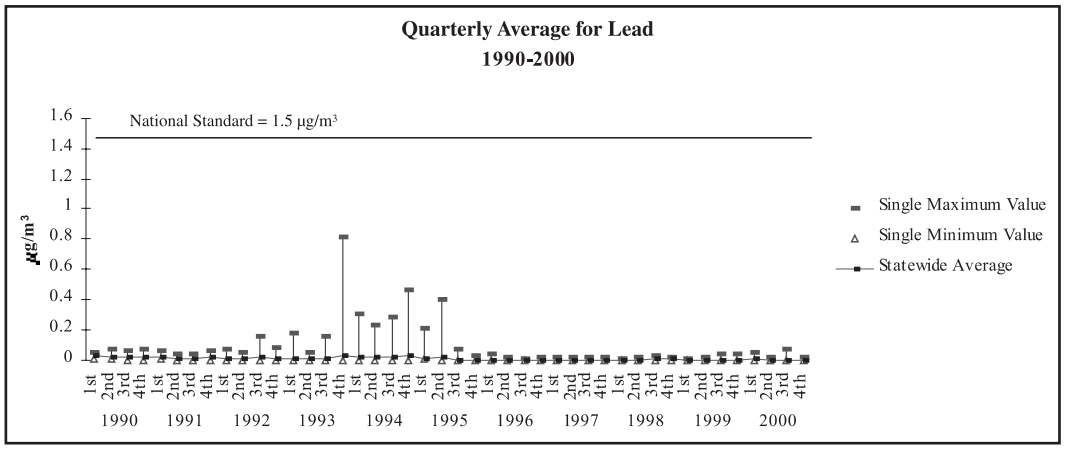
Lead (Pb) is a solid metal that can be found in air in a dust-like form called particulate matter. In the past, automobile sources were the major contributor of lead emissions. Because of the EPA's regulatory efforts in the 1980s and 1990s to eliminate the content of lead in gasoline, air emissions of lead from mobile sources have declined over the past decade. Today, industrial processes (primarily metals processing) are the major source of lead emissions. The highest air concentrations of lead are found in the vicinity of smelters and battery manufacturers. Lead can also be found in paint used in older houses. Lead paint was banned from residential application in 1978.

Health and Environmental Effects

Lead exposure occurs mainly through inhalation of air and ingestion of lead in food, water, soil or dust. It accumulates in the blood, bones and soft tissues. It can also adversely affect the kidneys, liver, nervous system and other organs. Excessive exposure to lead may cause neurological impairments such as seizures, mental retardation and behavioral disorders. At low doses, exposure to lead is associated with damage to the nervous systems of fetuses and young children, resulting in learning disabilities and lowered intelligence quotient. Recent studies have shown that lead may be a factor in high blood pressure and subsequent heart disease. Lead can also be deposited on the leaves of vegetation, presenting a hazard to grazing animals.

Trends in Lead Levels

There is only one national standard for lead, and it covers both primary and secondary concerns. The lead standard is a quarterly average of 1.5 µg/m^3. The maximum quarterly average has ranged from 0.01 µg/m^3 to 0.81 µg/m^3. Lead measurements between 1993 and 1995 were slightly elevated. The major peak occurred during the fourth quarter in 1993, in which lead measurement increased 88.9%. The peaks were related to a source-specific problem that has since been corrected. Since 1995, lead measurements have remained almost non-existent. Air quality in South Carolina is well below the national standard for lead.



1990: Phase out of leaded gasoline began

1995: EPA banned the use of leaded gasoline in highway vehicles

6 SULFUR DIOXIDE (SO_2)

Nature and Sources of the Pollutant

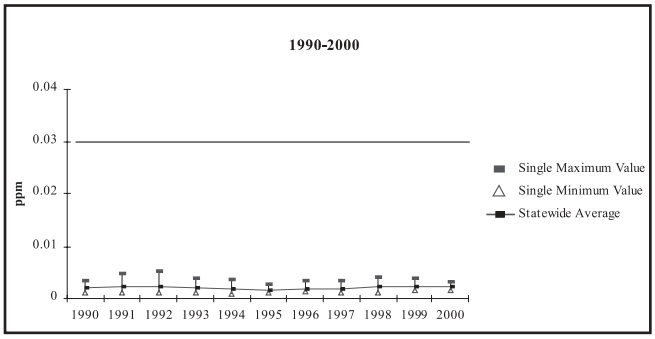
Sulfur dioxide (SO_2) is a gas formed from the burning of coal and oil and is part of smog and acid rain. Many monitoring stations are located in urban areas where the highest concentrations of SO_2 are recorded. This is due to the location of large industrial facilities. Fuel combustion, largely from coal-fired power plants, accounts for most of the total SO_2 emissions.

Health and Environmental Effects

For asthmatic individuals, short term exposure to SO_2 levels may result in breathing difficulties and may be accompanied by wheezing, chest tightness or shortness of breath. High concentrations of SO_2 can result in temporary breathing difficulties for asthmatic children and adults who are active outdoors. Other effects related to longer-term exposure to high levels of SO_2 combined with high levels of particulate matter include respiratory illness, alterations in the lungs' defenses and aggravation of existing cardiovascular disease. SO_2 is a major precursor to $PM_{2.5}$, which is a significant health concern, as well as the main pollutant that impairs visibility.

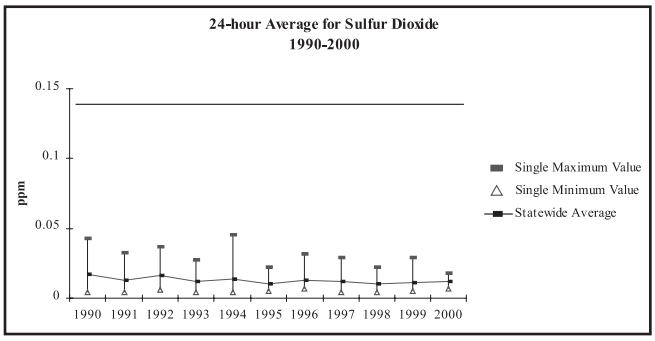
Combined SO_2 and NO_x are the components of acid rain that is harmful to both plant and aquatic life. They also accelerate corrosion of buildings, statues and monuments.

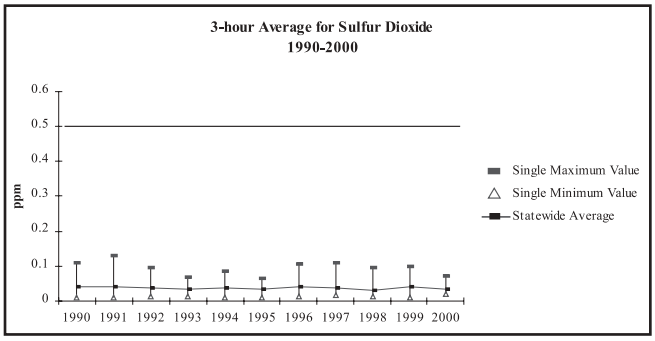
Trends in Sulfur Dioxide Levels



There are two primary national standards for SO_2 and one secondary national standard. The primary standards are an Annual Arithmetic Mean (AAM) of 0.03 ppm and a 24-hour average of 0.14 ppm. The Annual Arithmetic Mean is used to look at long-term concentrations of SO_2 in the ambient air, while the 24-hour standard is set to measure short-term concentration levels. Any short-term spikes in ambient concentrations are almost always attributable to a specific event and thus are immediately corrected.

The secondary SO_2 National Ambient Air Quality Standards is a 3-hour average concentration of 0.50 ppm (1,300 μ/m^3), not to be exceeded more than once a year.





During the past ten years, the single-site maximum Annual Arithmetic Mean concentrations have ranged from a low of 0.0028 ppm in 1995 to a high of 0.0052 ppm in 1992. The statewide averages have stabilized between 0.0015 ppm and 0.0023 ppm. During the same ten-year period, the single-site maximum for the 24-hour standard ranged from a low of 0.018 ppm in 1994 to a high of 0.046 ppm in 1994. The statewide averages have been between 0.010 ppm to 0.017 ppm. Also, the single-site maximum for the 3-hour standard within the same ten years ranged from a low of 0.064 ppm in 1995 to a high of 0.131 ppm in 1991. The statewide averages have been between 0.031 ppm to 0.043 ppm. South Carolina has been well below all national standards for SO_2.

REGIONAL HAZE: VISTAS

Visibility impairment is one of the most obvious effects of air pollution and occurs at many of our most treasured natural areas such as the Smoky Mountains. It also is an issue in urban areas. Visibility impairment is a result of the scattering and absorption of light by air pollution, including particles and gases. Primary particles, such as dust from roads or soot from wood combustion, are emitted directly into the air. Secondary particles are formed in the air from primary gaseous emissions. Humidity also plays a significant role in increasing the effect of pollution on visibility.

Because fine particles are frequently transported hundreds of miles, pollution that occurs in one state may contribute to the visibility impairment in another state. In mid-1999, the EPA identified Southeast States Air Resource Managers (SESARM) as the organization to coordinate regional haze and visibility issues in the southeast. Southeast States Air Resource Managers is a non-profit organization established by the eight states in EPA's Region 4 to assess and promote air quality issues within the southeastern region of the US. Because the federal regional haze planning activities in the southeast extend beyond the eight Southeast States Air Resource Managers states and include tribal partners, VISTAS (Visibility Improvement—State and Tribal Association of the Southeast) was formed. This association was established to initiate and coordinate regional strategies associated with the management of regional haze, to improve visibility, and to address other air quality issues.

EDUCATION AND OUTREACH

The Education and Outreach Section offers environmental education services on air quality issues to a wide variety of community organizations such as civic groups, teachers, students and the general population. Staff provides resource materials and presentations at no charge. Staff has been successful in partnering with the media to provide the ground-level ozone forecast and improve the knowledge of the health effects of exposure to ground-level ozone. Partnerships with various civic organizations and participation in public events that can raise awareness about air quality issues are given high priority. In 1998, a specific campaign entitled "Spare the Air" was designed as a partnership between the Bureau, industry and environmentalists. The goal of the public information campaign was to encourage individuals to voluntarily reduce air pollution.

INDOOR AIR QUALITY

The Bureau does not receive funding for an indoor air program. However, in recognition of the importance of indoor air quality and public health, the Bureau does offer certain referral services and resources. Many telephone calls regarding problems or concerns with air quality in the workplace, schools and private residences are received by the Bureau. In 1999, the Bureau received 58 calls and in the year 2000, the number increased to 106. As the public becomes more aware of problems related to poor indoor air quality, we expect to continue to see an increase in the number of calls received.

Bureau staff actively participates in groups such as the S.C. Asthma Planning Alliance. The efforts of the Alliance are designed to improve health management/quality of life for children with asthma. Membership in the Alliance consists of several program areas within SC DHEC, including district staff, and other agencies such as the S.C. Department of Health and Human Services, American Lung Association of South Carolina, non-profit organizations, and an allergy and asthma medical practice.

The Bureau's Web site on indoor air quality also addresses the issue of mold and provides general information for the public (www.scdhec.net/baq; click on *indoor air*).

Asthma Facts

- Since 1990, asthma and related conditions have been the leading cause of hospitalizations in SC for children ages 18 years and younger.
- The asthma prevalence rate is highest among those under 18 years old.
- Asthma is the leading cause of school days missed.
- Asthma attacks can be prevented and treated.

METEOROLOGY AND MODELING

Meteorologists in the Bureau began issuing advisories based on the forecasting of ambient ozone concentrations over the Columbia and Greenville metro areas in May of 1998. Daily forecasting of the ground-level ozone concentrations delivers an important public health message. Voluntary actions taken by citizens in response to this forecasting will help to keep levels down.

Since forecasting activities began, much has been learned about the formation and behavior of ozone in the South Carolina airshed. Observations have shown that ozone rarely forms on cool, cloudy days, even when ample concentrations of the precursor chemicals that contribute to ozone formation are present. However, when conditions are sunny and dry, ozone concentrations can reach historically high concentrations, even when precursor levels are reasonably low. Meteorologists have also determined that the main large-scale pattern over the Southeastern US during the spring and summer months, the Bermuda High, plays a crucial role in determining the severity and duration of high ozone events.

Global pattern shifts, such as El Niño, can alter the mean position of the Bermuda High. In 1998, for example, a strong El Niño caused a fairly significant westward shift in the Bermuda High. This set up an abnormally hot and dry summer over much of the southeast, with stagnant periods often lasting weeks at a time. As a result, the state experienced one of the most severe ozone seasons on record. In contrast, 2000 saw a complete relaxation of any dominant global circulation scheme, causing the Bermuda High to shift eastward, well out to sea. This opened the door for a cooler, cloudier, more active weather pattern to set up throughout most of the season, resulting in a marked decrease in overall ozone concentrations.

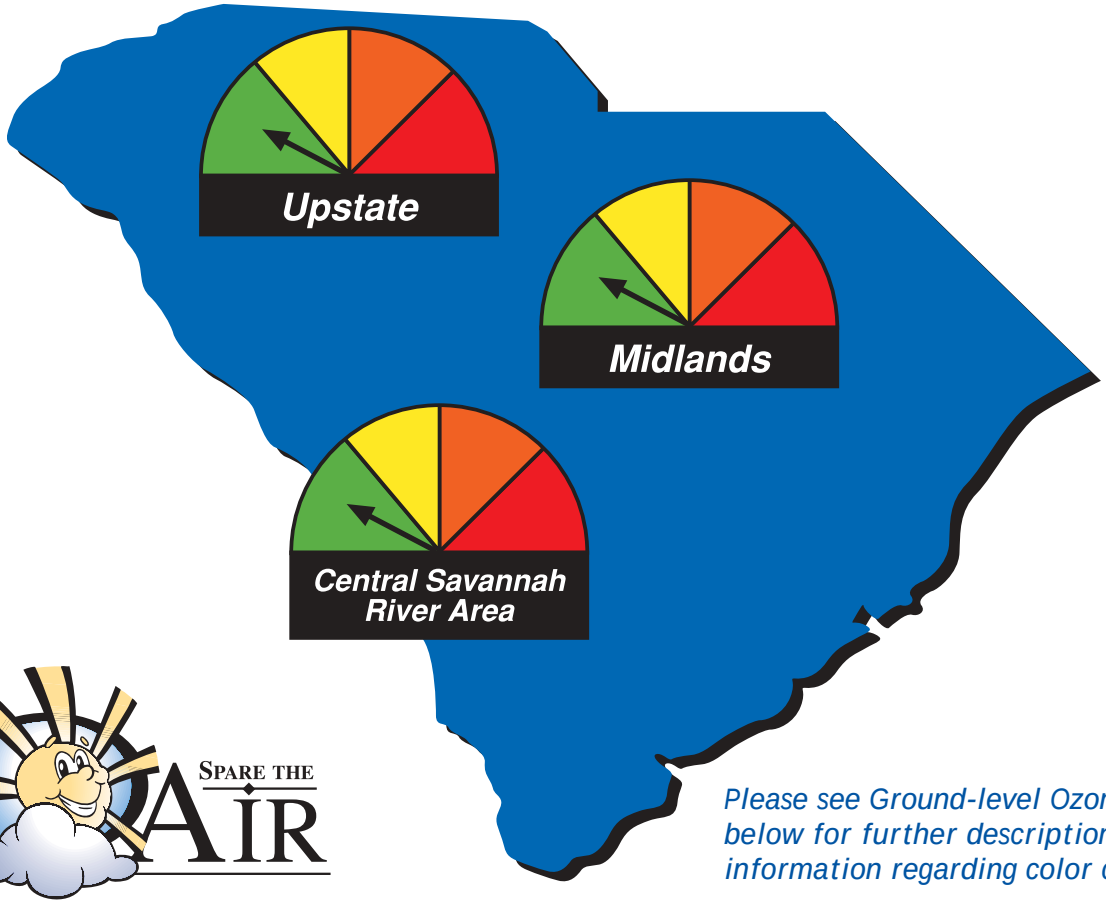
Currently, South Carolina is in attainment of the ozone standard; however, the newly proposed 8-hour standard from the federal level could potentially put some South Carolina counties in jeopardy of non-attainment. The areas of concern are mainly the urban, more populated areas of the state. The Columbia metro area, the Central Savannah River area, and the I-85 corridor are all areas that may be in jeopardy of non-attainment when the 8-hour ozone standard is implemented. In order to be proactive, South Carolina has contracted with Systems Applications International, Inc. (SAI) to do 8-hour ozone modeling for South Carolina. A base case scenario has been selected to use for sensitivity analysis. May 16 through 23, 1998, was identified as a base case for the 8-hour ozone modeling. This time period was looked at because there were a good number of exceedances of the 8-hour standard within a wide variety of meteorological regimes, especially with respect to wind direction and wind speed. A future case inventory has been developed to put into this model, along with the 1998 meteorology. This future case inventory is an inventory projected out to 2010. With 1998 meteorology and a "future case" inventory, our objective will be to identify ways in which South Carolina can mainly reduce NO_x emissions to help keep the levels of ozone lower under the same meteorological conditions necessary for the formation of ground-level ozone.

Using the latest forecasting tools, high ozone days can often be predicted. On days forecasted to have high concentrations, you can help reduce the formation of ground level ozone by:

- Driving less–automobiles are a significant source of NO_x and VOCs
- Carpooling–it is especially important to reduce the morning commute
- Shopping by phone, mail or the Internet or telecommuting if you can
- Riding public transit where available
- Combining your errands into one trip–plan ahead and save time and money
- Fueling up in the afternoon and avoiding adding more VOCs to the morning mix
- Walk or ride a bicycle to work or lunch

Remember, in South Carolina, a majority of air pollution comes from cars and trucks. Even though cars and trucks run ninety percent cleaner today than they did in 1970, we are driving more miles than ever before, and this offsets the advantages gained from “cleaner” technology.

GROUND-LEVEL OZONE FORECASTING



Please see Ground-level Ozone index below for further description and information regarding color codes.

GROUND-LEVEL OZONE INDEX			
Air Quality Index (AQI)	**AQI Color Code**	**Ozone Concentration**	**Cautionary Statement**
0 - 50	Good	0.0 to 0.064 ppm	No health effects are expected.
51 - 100	Moderate	0.065 to 0.084 ppm	Unusually sensitive people should consider limiting prolonged outdoor exertion.
101 - 150	Unhealthy for Sensitive Groups	0.085 to 0.104 ppm	Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.
151 - 200	Unhealthy	0.105 to 0.124 ppm	Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.

ppm=parts per million

SOURCE EVALUATION

As part of permit requirements, some facilities are required to test emission sources periodically. The Bureau observes some source tests and reviews the final reports submitted for these tests. These two activities ensure quality emissions and process data. Information generated from these reports is used to determine compliance status, emission rates, and process conditions. This emission data is also used in the determination of air fees and penalties of violations, if any. Observation ensures that source test data is collected using the proper and approved EPA methodology.

The percentage of high priority tests observed and reports reviewed are indicators of performance. A high priority test is defined as any test whose results could make a significant impact of the compliance status of the facility. Also taken into account are the compliance and enforcement history of the facility, the complexity of the testing, and the frequency of the testing.

2000 Stack Testing Data

278 Total Tests
229 High Priority Tests
69.9% of High Priority Tests Observed

ENFORCEMENT

The main objective of the Enforcement Section is to facilitate the return of facilities, individuals, corporations, or municipalities in non-compliance to compliance. To accomplish this objective, the Air Compliance Section utilizes five mechanisms:

- Notice of Non-Compliance
- Notice of Violations (NOVs)
- Notice of Enforcement Conference
- Consent Orders
- Administrative Orders

2000 Enforcement Data

- Issued 322 NOVs (Central Office):
- 251 for Stationary Sources
- 40 for Asbestos
- 31 for Opening Burning

Issued 116 Orders (Central Office):

- 89 for Stationary Sources
- 10 for Asbestos
- 17 for Open Burning

Total Penalties assessed: $662,740

AIR TOXICS

Naturally Occuring and Man-Made Sources

Air toxics, otherwise known as hazardous air pollutants, are air pollutants that are known to or are suspected of causing serious health effects. Air toxics can exist in the form of particulate matter or as gases. Some examples are arsenic, asbestos, benzene, vinyl chloride, mercury,

chromium, toluene and beryllium. Most air toxics originate from man-made sources, including mobile sources (cars, trucks, construction equipment), stationary sources (factories, refineries, power plants), as well as indoor sources (some building materials, pesticides and cleaning solvents). Some air toxics are released from natural sources such as volcanoes and forest fires. The EPA is working with state governments to reduce emissions from the 188 air toxics listed in the Clean Air Act.

Health and Environmental Effects

Exposure to air toxics in sufficient concentrations and for sufficient durations may increase the risk of getting cancer or experiencing other serious health effects. Depending upon which air toxics a person is exposed to, these health effects can include damage to the immune system, as well as neurological, reproductive (reduced fertility), developmental, and respiratory problems.

Toxic air pollutants deposited on soils or surface waters have an environmental impact. Numerous studies conclude that deposited air toxics contribute to birth defects, reproductive failure, and disease in animals. A build up of large amounts can be harmful to plants and animals or to a person consuming these plants and animals; for example, mercury in fish.

2000

96 Risk Management Plans (RMPs) reviewed

32 On-site Risk Management Program facility inspections

2,427 Emergency Planning & Community Right-to-Know Act (EPCRA) Tier II Hazardous Chemical Inventory Reports reviewed

TOXIC RELEASE INVENTORY (TRI)

South Carolina industries have been reporting their use of toxic chemicals for fifteen years under Section 313 of the Federal Emergency Planning Community Right-to-Know Act, also known as the Toxics Release Inventory (TRI). Over that time, new industry sectors have been added to the Toxics Release Inventory and certain chemicals have either been added or delisted. To examine the decade trend in state Toxics Release Inventory data, this report will follow the core of industries and chemicals covered consistently throughout the decade of the 90s. Facilities show overall reduction in releases to the environment on-site through 2000.

Reporting under this law carries no obligation to reduce releases or use of toxic chemicals. According to the EPA, " …information from the Toxics Release Inventory helps citizens and public officials hold companies accountable, make informed decisions about the management of toxic chemicals in their communities, and teaches about potential risks."

Toxic Release Inventory Trends

	Releases to Land	Air Emissions	Surface Water Discharges
1991	838,703	49,864,847	563,011
1992	1,549,457	49,730,791	482,187
1993	569,703	44,026,173	553,846
1994	665,273	41,620,230	595,200
1995	703,206	43,664,393	575,117
1996	835,491	39,357,559	728,628
1997	2,008,345	36,258,979	880,292
1998	1,841,867	37,614,743	906,358
1999	3,372,247	36,114,731	774,184
2000	1,754,677	31,490,291	661,858

On-site releases: SC1991 core industries and chemicals.
All table figures are given in pounds.

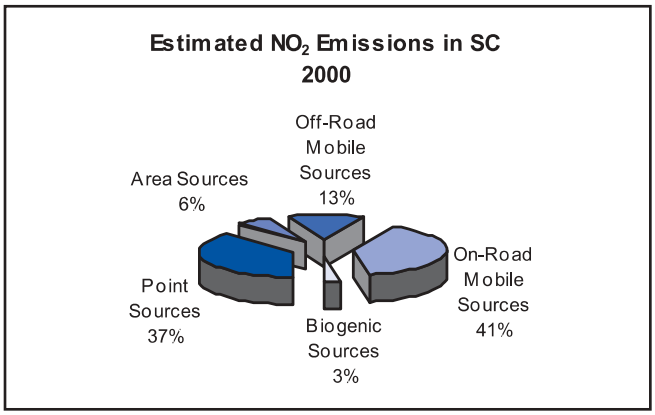
At a minimum, Toxics Release Inventory forces companies to maintain detailed book-keeping on the import, production, or processing of widely-used chemicals known for a variety of health hazards. This

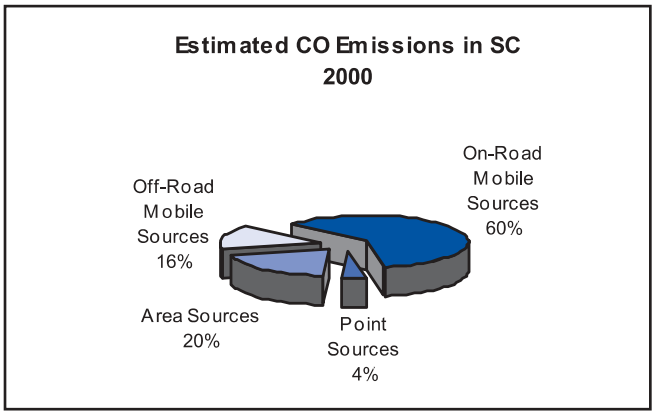
closer look has inspired many companies over the years to employ cost-effective source reduction savings through product substitution, product recovery, and pollution prevention.

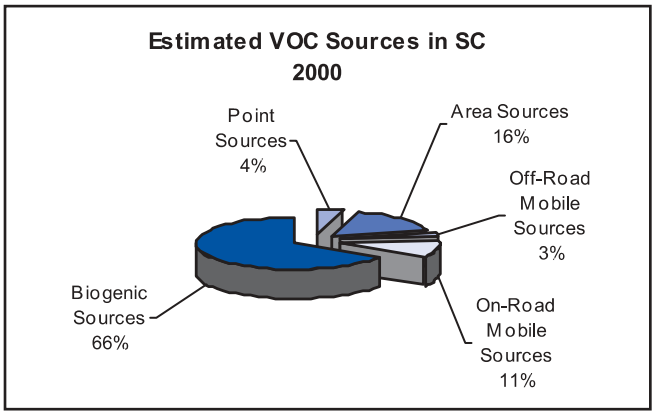
EMISSIONS INVENTORY

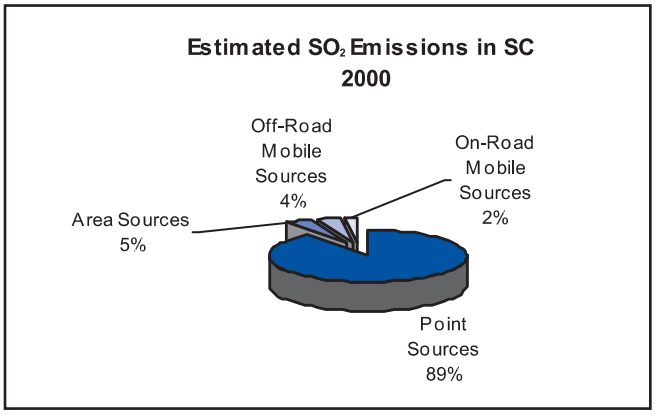
Emissions inventory is a way of identifying and estimating air emissions in our state. A standard process is used to account for emissions from a wide variety of sources. Data is quality-assured to achieve accuracy and completeness. This information is important for use in policy and other decision-making processes, and collection of the data is required by the EPA. Much of the data collected in the emission inventory process is later used in air quality models and as a basis for fees imposed on those emission sources.

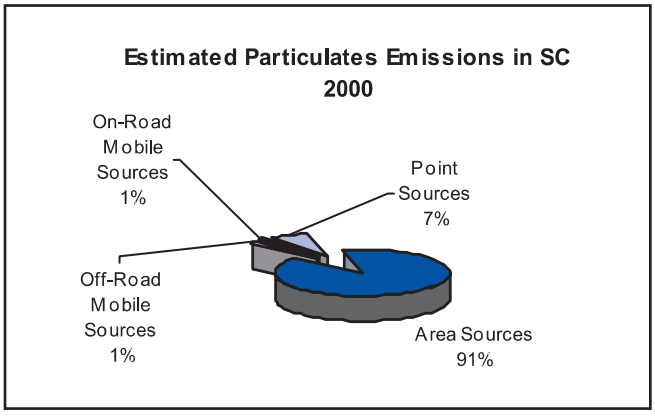
The sources for which an emission inventory is completed











Emissions inventory data is collected every other year and updated data will be available in the 2001 annual report.

include point sources, area sources, biogenic sources, and mobile sources. Point sources are stationary sources such as electric utilities, asphalt plants, steel mills, and most large industrial sources. Area sources individually do not make a large contribution to air pollution levels, but when added together, they may have a large impact. Examples of area sources include gas-powered lawn equipment, everyday materials such as paint and lighter fluid, house painting, gas stations, and dry cleaners. Biogenic emissions are not man-made. For example, forest fires, trees, and other vegetation are natural sources of air pollution. Examples of mobile sources are passenger cars, motorcycles, buses, trucks, trains, airplanes, and construction equipment.

ASBESTOS

Asbestos is a name given to a group of minerals that break apart into very fine and strong fibers. It is found worldwide in certain types of rocks. The EPA listed asbestos as an unsafe pollutant or hazardous air pollutant, in the early 1970s. Asbestos has been used frequently in the past because it is strong and flexible and will not burn. It has been used to make many household products; building materials for factories, schools, and public buildings; and paper products. People are exposed to asbestos by breathing in asbestos fibers released into the air when materials containing asbestos are damaged. Health problems linked to asbestos can take many years to appear. Exposure to asbestos can cause asbestosis, which is scarring and inflammation of the lungs, and cancers of the esophagus, colon, pancreas and stomach.

In 1986, SC DHEC promulgated regulations governing the performance of asbestos abatement projects. The Bureau is responsible for overseeing renovations and demolition of regulated facilities that are determined to contain asbestos. This oversight includes the following activities:

- licensing renovation and demolition projects
- licensing personnel who work to remove asbestos
- auditing asbestos training courses to ensure workers receive effective training
- ensuring proper asbestos disposal
- inspecting asbestos sources to ensure removal is done correctly.

Carrying out these functions ensures that asbestos is removed according to regulation and in a manner protective of the public's health. Demolitions are regulated by the SC DHEC and EPA. SC DHEC must be notified at least ten working days before starting demolition and an inspection for asbestos is required.

To enhance SC DHEC's ability to regulate asbestos abatement activities adequately, the general assembly in 1988 established fees for asbestos projects and for asbestos personnel licences. Asbestos removal peaked during the 1990s and has declined slowly since that time. The decline in removal is due in part to better public understanding of the risks and to the greater acceptance of managing undamaged asbestos in place. Although use of asbestos in many products is now prohibited, asbestos-containing products may still be imported and used in various applications.

PERMITTING

To maintain air pollution laws and regulations, the Bureau has a permitting system for industrial and commercial facilities that emit pollutants into the ambient air. A permit is a legal document that limits the amount of regulated pollutants that may be released by the permitted source. Before construction of a new facility begins, or before changes or additions are made to existing sources of air pollution, permission must be obtained from the Bureau.

1993: Implementation of Title V Operating Permit Program
Creation of Small Business Assistance Program

State regulations (R.61-62) provide the basis for the Bureau permitting system. These regulations allow for the issuance of all types of air permits which set limits on emissions. In South Carolina, state regulations may be more stringent than those set at the federal level. In addition to construction permits, the Bureau has authority to issue the following types of permits:

- **Title V Operating Permit:**
  The purpose of the Title V Operating Permit Program is to provide a comprehensive air quality operating permit for all major sources of air contaminants. The Title V Operating Permit Program applies to any major facility defined as having the potential for uncontrolled emissions of 100 tons per year or more, or which has the potential for uncontrolled emissions of any one hazardous air pollutant of 10 tons per year or more, or any combination of hazardous air pollutants totaling 25 tons per year or more.
- **Conditional Major Operating Permit:**
  An operating permit that limits the facility's potential to emit below Title V Major source status as defined in SC DHEC's Regulation 61-62.70, "Title V Operating Permit Program."
- **Minor Source Operating Permit:**
  An operating permit for facilities that have the potential to emit less than 100 tons per year of any criteria pollutant, less than 10 tons per year of any single hazardous air pollutant, or less than 25 tons per year of more than one hazardous air pollutant.

South Carolina also has a Prevention of Significant Deterioration (PSD) regulation based on the federal Prevention of Significant Deterioration program. This regulation allows only minimal emission impact on soils, vegetation, and visibility (in Class I areas) by new sources. Class I areas are parks and wilderness areas that the U.S. Congress has designated to be preserved in relatively pristine condition. South Carolina has a single Class I area—Cape Romain National Refuge—located near Charleston. Air emissions from South Carolina facilities have the potential to impact Class I areas in other states as well.

Additionally, the Bureau was delegated authority from the EPA to implement most New Source Performance Standards (NSPS) and certain National Emission Standards for Hazardous Air Pollutants (NESHAP). New Source Performance Standards regulate criteria and National Emissions Standards for Hazardous Air Pollutants are federally mandated regulations developed on an industry or process-specific basis.

As a result of the passage of the 1993 Restructuring Act, SC DHEC adopted a more streamlined approach to the permitting process; the goal being to reduce the amount of time that a permit application is reviewed and the final permit issued.

The Small Business Assistance Program (SBAP) was established in August 1993 to provide environmental technical assistance to small businesses. Section 507 of the Clean Air Act Amendments makes clear that the Small Business Assistance Program is intended primarily to benefit small businesses that do not have the technical or financial capabilities to meet environmental requirements without Small Business Assistance Program aid. The following objectives are set forth for the program:

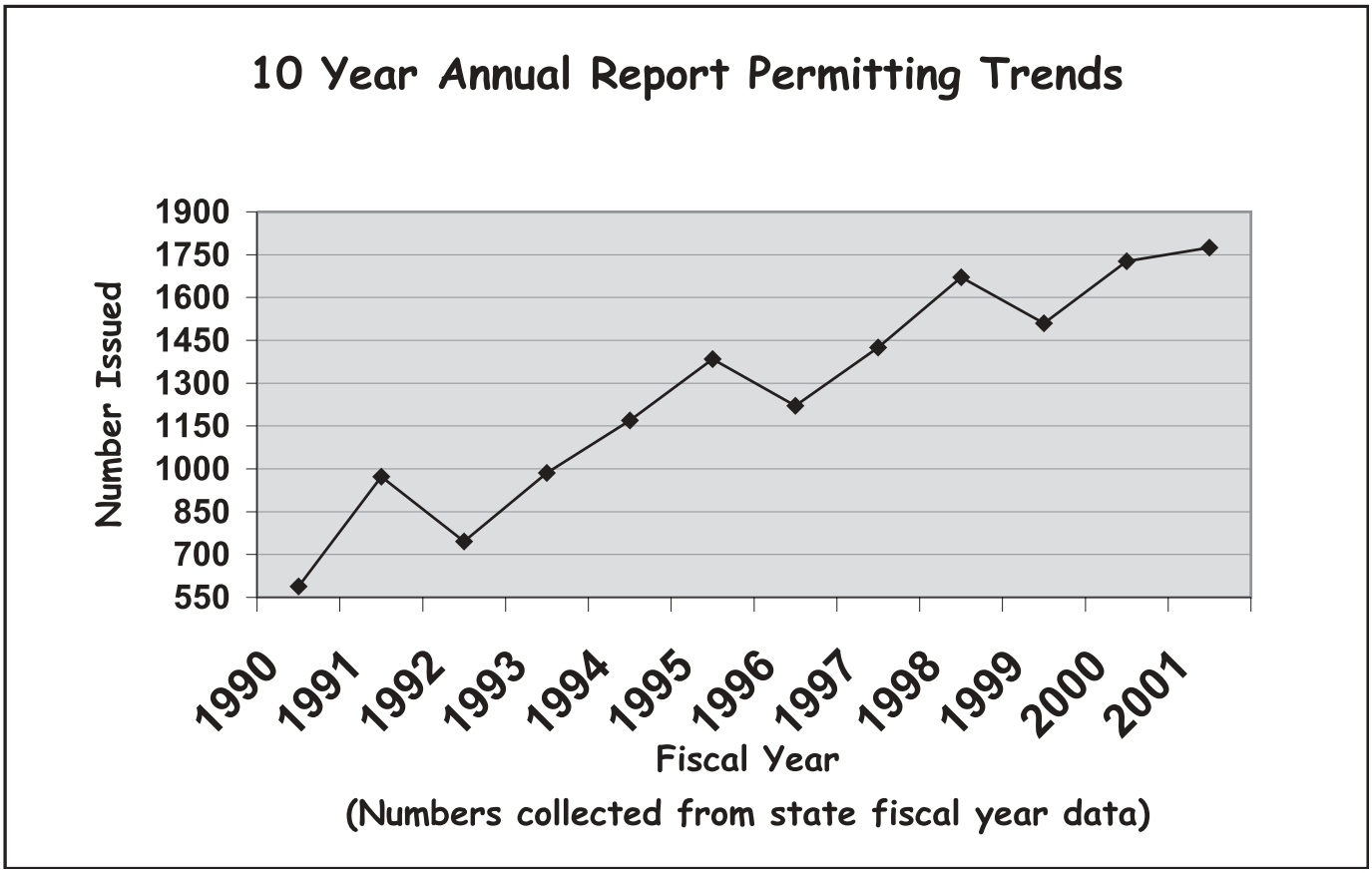
- Help facilities determine which regulations apply to them;
- Inform facilities of their rights and obligations;
- Provide technical and compliance information to the regulated community;
- Provide information on pollution prevention and accidental release prevention/detection; and
- Provide confidential one-on-one consultation through an audit program.

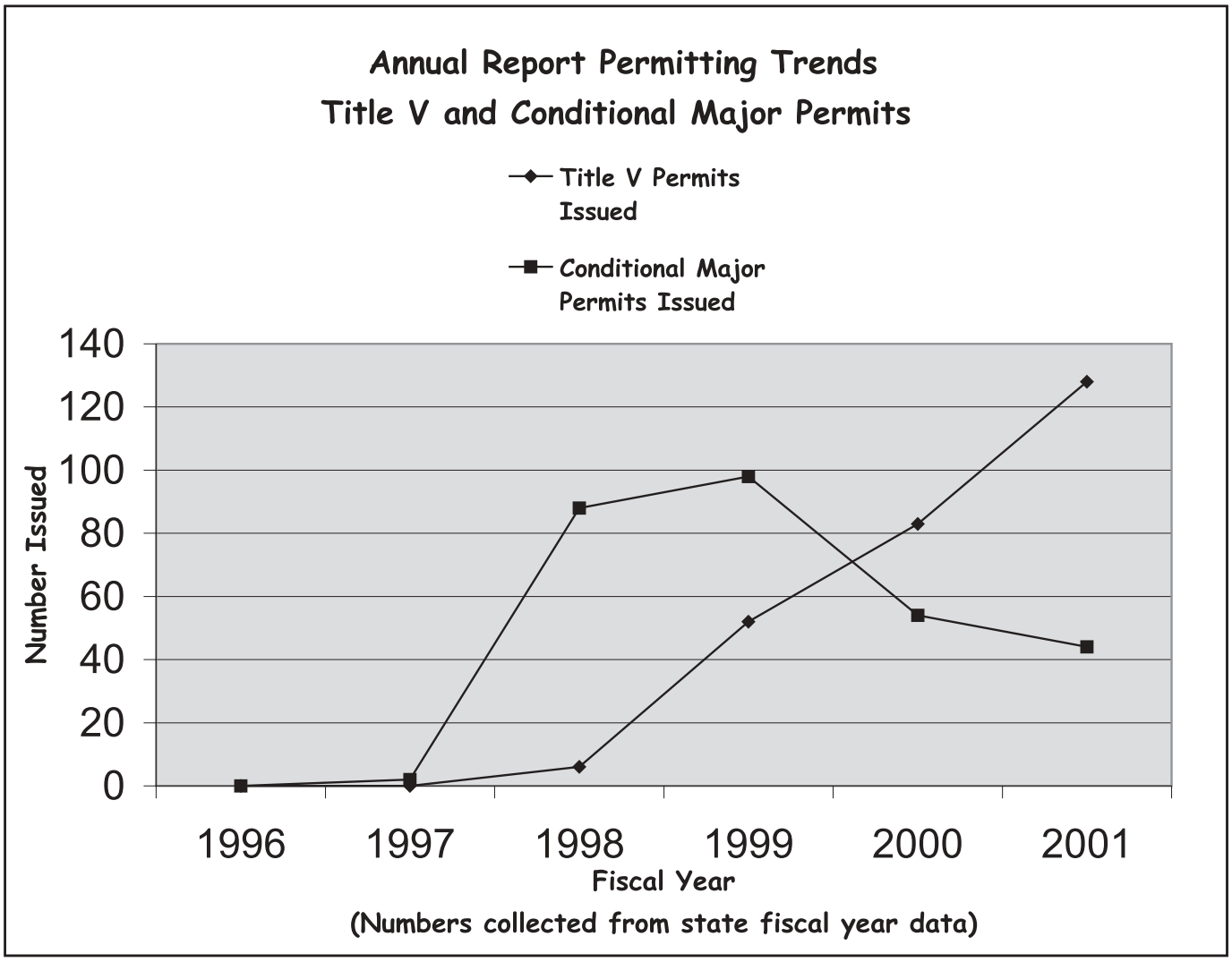
TECHNICAL MANAGEMENT

The Technical Management Section of the Bureau of Air Quality reviews facility monitoring reports to determine conformity with state and federal regulations and permit requirements. Computerized databases are used to track these periodic submittals. The section also reviews all inspection/investigation reports generated by district inspectors for consistency. The section is responsible for reviewing and approving air pollution control device monitoring plans, operational ranges required in Title V permits, and assessing the accuracy of annual compliance certifications. The section also carries out district liaison activities, performs quality assurance assessments of source inspectors, and provides training for district personnel.

Technical Management Section 2000

- Reviewed over 6,000 periodic monitoring reports
- Reviewed over 2,385 inspection/ investigation reports
- Reviewed over 800 continuous emission monitoring reports
- Reviewed over 150 control device monitoring plans
- Reviewed over 76 annual compliance certifications
- Conducted 12 district inspector quality assurance evaluations





Fiscal Year	PSD Permits Issued
2000	13
2001	11

ENVIRONMENTAL SERVICES

District Air Services

There are 12 Environmental Quality Control (EQC) district offices located around the State. District personnel include some or all of the following specialists: inspectors, biologists, chemists, geologists, engineers, field technicians, and support staff. The districts are involved in most Environmental Quality Control programs including water and wastewater quality, air quality, solid and hazardous waste, recreational waters, radiological health, and on the coast, shellfish sanitation.

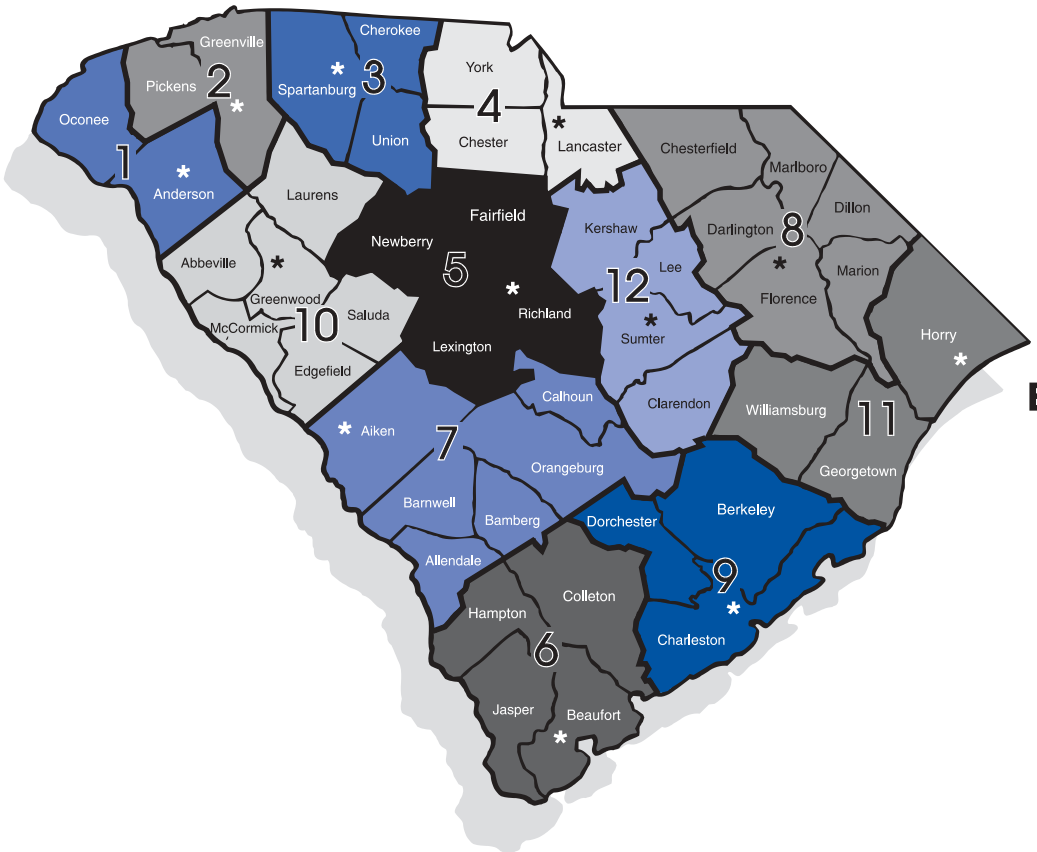
District air quality staff provide a number of services designed to protect air quality. One of the primary responsibilities is responding to citizen concerns involving excessive emissions, odors, open (outdoor) burning and inspection of facilities. When a non-emergency call is received by the district office, response is guaranteed within 48 hours. Typically, an inspector is sent out within one working day.

EQC Air Laboratory

Air Laboratory staff provide monitoring and laboratory services to various programs within the Air Program. Basic services include environmental monitoring, sample analyses and management.

Environmental Services Activity for 2000

- Total Inspections/Investigations conducted: 2,136
- Complaint Investigations: 1,668
- Investigation related to Open Burning: 721
- Notices of Violation Issued for Open Burning (from Central and District Offices): 295



EQC DISTRICT OFFICES

1 - Appalachia I
2 - Appalachia II
3 - Appalachia III
4 - Catawba
5 - Central Midlands
6 - Low Country
7 - Lower Savannah
8 - Pee Dee
9 - Trident
10 - Upper Savannah
11 - Waccamaw
12 - Wateree

* District Office Locations

SUMMARY

Protecting and improving air quality is essential to safeguarding public health and protecting our natural resources. Air quality is a shared resource which all South Carolinians bear responsibility for improving. The average adult breathes in about 3,400 gallons of air per day. Even though much of the pollution in our air comes from power plants, industrial sources and mobile sources, individuals can make daily choices to decrease air pollution and protect their health.

With the growing population in South Carolina, vehicle emissions are a major contributor to the production of air pollution. Initiatives within the Bureau are currently being developed to give employees voluntary options to help reduce air pollution. Programs such as "Spare the Air" and "Take a Break From the Exhaust" encourage employees to modify their personal driving habits by staying in for lunch, carpooling, and working adjusted schedules.

It is a proven fact that air quality has a direct effect on human health and the environment. During 1990-2000, South Carolina has been one of only a small number of states that has met all federal standards for the six criteria pollutants. It is important to note that ambient air in South Carolina has not gotten worse over the past decade but the national air standards for $PM_{2.5}$ and ground-level ozone have become more stringent.

In an effort to ensure both clean air and a reliable, affordable energy supply, we must continue to develop new strategies and partners to address issues such as regional haze and pollutants that threaten public health.

Data shown in this report reflect trends towards continuous improvement in South Carolina's air quality. South Carolinians have enjoyed good air quality. With everyone's help and a proactive attitude, we will work together to maintain it and help shape our future.

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A special thanks to all those who made contributions to this publication.

Total Suspended Particulate (TSP) - μ g/m³

[Air quality standard = 75 μ g/m³ Annual Geom. Mean]

SITE ID	COUNTY	UTM-E	UTM-N	SITE NAME	CITY	GEOM. MEAN.	MAXIMUM 24-HR VALUES 1ST	2ND	3RD	4TH	OBSV	% Complete
45-003-1001	AIKEN	417056	3699183	BEECH ISLAND FIRE STATION		40	93	88	74	67	46	75%
45-013-0007	BEAUFORT	530355	3588470	BEAUFORT KING STREET	BEAUFORT	27	60	47	47	45	55	90%
45-019-0003	CHARLESTON	595649	3638503	JENKINS AV. FIRE STATION	NORTH CHARLESTON	41	87	83	78	71	57	93%
45-019-0046	CHARLESTON	625554	3645337	CAPE ROMAIN WILDLIFE REFUGE		26	71	59	51	51	58	95%
45-019-0047	CHARLESTON	598473	3634157	U S NAVAL BASE	NORTH CHARLESTON	35	76	75	62	60	59	97%
45-033-0001	DILLON	649208	3809572	DILLON CITY-COUNTY OFFICE BLDG.	DILLON	38	62	33	27		3	50%
45-041-0001	FLORENCE	610696	3784358	FLORENCE COUNTY HEALTH DEPT	FLORENCE	40	95	70	69	67	60	98%
45-043-0002	GEORGETOWN	658389	3693255	HOWARD HIGH SCHOOL	GEORGETOWN	45	130	99	99	97	71	97%
45-043-0006	GEORGETOWN	658711	3692520	GEORGETOWN CMS	GEORGETOWN	73	158	157	138	124	60	82%
45-043-0007	GEORGETOWN	658375	3690944	MARYVILLE POWER SUB STATION	GEORGETOWN	26	66	49	45	44	71	97%
45-043-0009	GEORGETOWN	659490	3693858	WINYAH	GEORGETOWN	46	158	138	136	118	69	95%
45-045-0008	GREENVILLE	371736	3855846	GREENVILLE HEALTH DEPT	GREENVILLE	38	139	76	68	61	51	84%
45-045-2002	GREENVILLE	387723	3866851	1ST BAPTIST CHURCH ANNEX	GREER	32	103	77	71	71	56	92%
45-047-0001	GREENWOOD	393814	3782427	GREENWOOD COUNTY DSS	GREENWOOD	32	297	77	60	60	55	90%
45-047-0002	GREENWOOD	393053	3780864	PREMIER ROAD		32	62	59	57	56	58	95%
45-049-0001	HAMPTON	489216	3637122	HAMPTON I	HAMPTON	37	83	74	67	66	55	90%
45-051-0002	HORRY	696737	3731000	MYRTLE BEACH EQC OFFICE	MYRTLE BEACH	32	81	58	56	54	53	87%
45-059-0001	LAURENS	406283	3818121	LAURENS COUNTY OFFICE COMPLEX	LAURENS	25	63	54	49	43	60	98%
45-063-0005	LEXINGTON	488916	3738007	SALTECH		31	67	64	62	61	53	87%
45-063-1002	LEXINGTON	493969	3758514	CAYCE FIRE STATION	CAYCE	42	125	81	73	72	57	93%
45-079-0006	RICHLAND	497871	3762547	SC DEPT. PROBATION, PAROLE	COLUMBIA	40	91	81	67	67	57	93%
45-079-0007	RICHLAND	503485	3772372	PARKLANE	COLUMBIA	33	88	74	74	59	60	98%
45-079-0014	RICHLAND	498204	3760083	ENRIGHT (REX) ATHLETIC CENTER	COLUMBIA	43	124	122	120	100	56	92%
45-079-0021	RICHLAND	520258	3741410	CONGAREE BLUFF*		22	48	41	38	37	47	85%
45-079-1006	RICHLAND	516067	3741587	CONGAREE SWAMP NATIONAL MONUMENT*		15	19	16	13	12	4	67%
45-083-0001	SPARTANBURG	414850	3867421	SPARTANBURG CITY HALL	SPARTANBURG	36	86	84	76	74	54	89%
45-085-0001	SUMTER	561238	3753536	SUMTER COUNTY HEALTH DEPARTMENT	SUMTER	34	83	59	58	57	59	97%
45-091-0005	YORK	499924	3868718	ROCK HILL WATER FILTER PLANT	ROCK HILL	41	86	75	68	62	58	95%
ANNUAL STATE WIDE AVERAGE =>						36					54	91.6%
STATE WIDE MAXIMUMS =>							297	158	158	157		

*PARTIAL YEAR - CONGAREE SWAMP site discontinued and replaced by CONGAREE BLUFF site

Lead (Pb) - μ g/m³

[Air quality standard = 1.5 μ g/m³ Quartly Mean]

						1ST QUARTER		2ND QUARTER		3RD QUARTER		4TH QUARTER		
SITE ID	COUNTY	UTM-E	UTM-N	SITE NAME	CITY	OBSV.	MEAN	OBSV.	MEAN	OBSV.	MEAN	OBSV.	MEAN	OBSV.
45-003-1001	AIKEN	417056	3699183	BEECH ISLAND FIRE STATION		14	0.00	12	0.01	11	0.00	9	0.00	46
45-013-0007	BEAUFORT	530355	3588470	BEAUFORT KING STREET	BEAUFORT	15	0.00	14	0.00	13	0.00	13	0.00	55
45-019-0003	CHARLESTON	595649	3638503	JENKINS AV. FIRE STATION	NORTH CHARLESTON	15	0.02	14	0.01	13	0.01	15	0.01	57
45-019-0046	CHARLESTON	625554	3645337	CAPE ROMAIN WILDLIFE REFUGE		15	0.00	14	0.00	14	0.00	15	0.00	58
45-019-0047	CHARLESTON	598473	3634157	U S NAVAL BASE	NORTH CHARLESTON	15	0.02	14	0.01	15	0.01	15	0.01	59
45-033-0001	DILLON	649208	3809572	DILLON CITY-COUNTY OFFICE BLDG.	DILLON	3	0.05							3
45-041-0001	FLORENCE	610696	3784358	FLORENCE COUNTY HEALTH DEPT.	FLORENCE	16	0.01	15	0.01	15	0.01	14	0.01	60
45-043-0002	GEORGETOWN	658389	3693255	HOWARD HIGH SCHOOL	GEORGETOWN	24	0.01	17	0.01	15	0.00	15	0.01	71
45-043-0006	GEORGETOWN	658711	3692520	GEORGETOWN CMS	GEORGETOWN	20	0.01	13	0.01	12	0.01	15	0.01	60
45-043-0007	GEORGETOWN	658375	3690944	MARYVILLE POWER SUB STATION	GEORGETOWN	26	0.00	17	0.00	14	0.00	14	0.00	71
45-043-0009	GEORGETOWN	659490	3693858	WINYAH	GEORGETOWN	24	0.01	15	0.02	15	0.02	15	0.01	69
45-045-0008	GREENVILLE	371736	3855846	GREENVILLE HEALTH DEPT.	GREENVILLE	16	0.02	11	0.01	12	0.01	12	0.01	51
45-045-2002	GREENVILLE	387723	3866851	1ST BAPTIST CHURCH ANNEX	GREER	15	0.00	13	0.00	15	0.01	13	0.01	56
45-047-0001	GREENWOOD	393814	3782427	GREENWOOD COUNTY DEPT.	GREENWOOD	15	0.01	11	0.01	15	0.00	14	0.01	55
45-047-0002	GREENWOOD	393053	3780864	PREMIER ROAD		15	0.02	15	0.02	14	0.02	14	0.02	58
45-049-0001	HAMPTON	489216	3637122	HAMPTON I	HAMPTON	15	0.00	12	0.00	14	0.00	14	0.00	55
45-051-0002	HORRY	696737	3731000	MYRTLE BEACH EQC OFFICE	MYRTLE BEACH	16	0.01	13	0.01	11	0.00	13	0.01	53
45-059-0001	LAURENS	406283	3818121	LAURENS COUNTY OFFICE COMPLEX	LAURENS	16	0.01	14	0.00	15	0.00	15	0.00	60
45-063-0005	LEXINGTON	488916	3738007	SALTECH		14	0.01	14	0.01	12	0.01	13	0.01	53
45-063-1002	LEXINGTON	493969	3758514	CAYCE FIRE STATION	CAYCE	15	0.02	15	0.01	12	0.01	15	0.01	57
45-079-0006	RICHLAND	497871	3762547	SC DEPT. PROBATION, PAROLE	COLUMBIA	14	0.04	15	0.01	14	0.00	14	0.01	57
45-079-0007	RICHLAND	503485	3772372	PARKLANE	COLUMBIA	16	0.01	15	0.00	14	0.07	15	0.00	60
45-079-0014	RICHLAND	498204	3760083	ENRIGHT (REX) ATHLETIC CENTER	COLUMBIA	15	0.01	14	0.01	14	0.01	13	0.01	56
45-079-0021	RICHLAND	520258	3741410	CONGAREE BLUFF*		9	0.00	15	0.00	11	0.00	12	0.00	47
45-079-1006	RICHLAND	516067	3741587	CONGAREE SWAMP NATIONAL MONUMENT*		4	0.00							4
45-083-0001	SPARTANBURG	414850	3867421	SPARTANBURG CITY HALL	SPARTANBURG	14	0.01	14	0.01	13	0.01	13	0.01	54
45-085-0001	SUMTER	561238	3753536	SUMTER COUNTY HEALTH DEPARTMENT	SUMTER	15	0.01	15	0.01	15	0.00	14	0.01	59
45-091-0005	YORK	499924	3868718	ROCK HILL WATER FILTER PLANT	ROCK HILL	16	0.04	14	0.01	15	0.01	13	0.01	58
ANNUAL STATE WIDE AVERAGE =>						15	0.01	14	0.01	14	0.01	14	0.01	54

*PARTIAL YEAR - CONGAREE SWAMP site discontinued and replaced by CONGAREE BLUFF site

Carbon Monoxide (CO) - ppm

[Air quality standard = 35 ppm 1hr Max, 9 ppm 8hr Max]

SITE ID	COUNTY	UTM-E	UTM-N	SITE NAME	CITY	MAX 1-HR 1ST	MAX 1-HR 2ND	MAX 1-HR OBS> 35	MAX 8-HR 1ST	MAX 8-HR 2ND	MAX 8-HR OBS> 9	OBSV.	% Complete
45-019-0005	CHARLESTON	598631	3628738	ASHE STREET	CHARLESTON	4.8	4.4	0	3.3	2.7	0	8657	99%
45-045-0008	GREENVILLE	371736	3855846	GREENVILLE HEALTH DEPT	GREENVILLE	5.3	5.3	0	3.7	3.6	0	8001	91%
45-079-0020	RICHLAND	496845	3763656	STATE HOSPITAL	COLUMBIA	4.8	4.6	0	3.7	3.6	0	8544	97%
ANNUAL STATE WIDE AVERAGE =>								0			0	8401	95.6%
STATE WIDE MAXIMUMS =>						5.3	5.3		3.7	3.7			

Background Concentrations for Modeling Purposes:*

Carbon Monoxide (CO) - μ g/m³

[Air quality standard = 40,000 μ g/m³ 1hr Max, 10,000 μ g/m³ 8hr Max]

SITE ID	COUNTY	UTM-E	UTM-N	SITE NAME	CITY	MAX 1-HR 1ST	MAX 1-HR 2ND	MAX 8-HR 1ST	MAX 8-HR 2ND
45-019-0005	CHARLESTON	598631	3628738	ASHE STREET	CHARLESTON	5520	5060	3795	3105
45-045-0008	GREENVILLE	371736	3855846	GREENVILLE HEALTH DEPT	GREENVILLE	6095	6095	4255	4140
45-079-0020	RICHLAND	496845	3763656	STATE HOSPITAL	COLUMBIA	5520	5290	4255	4140

*The ppm concentrations were converted to μg/m concentrations, using the CO conversion factor μg/m = 1.150 * ppm * 1000, to obtain backgound concentrations used in air dispersion modeling analyses.

Sulfur Dioxide (SO_2) - ppm

[Air quality standard = 0.03 ppm Annual, 0.139 ppm 24hr, 0.494 ppm 3hr]

						ANNUAL	MAX 24HR			MAX 3HR			
SITE ID	COUNTY	UTM-E	UTM-N	SITE NAME	CITY	MEAN	1ST	2ND	OBS> 0.14	1ST	2ND	OBS> 0.50	1ST
45-011-0001	BARNWELL	456692	3686698	BARNWELL CMS		0.002	0.007	0.007	0	0.022	0.021	0	0.045
45-019-0003	CHARLESTON	595649	3638503	JENKINS AV. FIRE STATION	NORTH CHARLESTON	0.003	0.016	0.013	0	0.044	0.034	0	0.059
45-019-0046	CHARLESTON	625554	3645337	CAPE ROMAIN WILDLIFE REFUGE		0.002	0.009	0.009	0	0.027	0.024	0	0.064
45-043-0006	GEORGETOWN	658711	3692520	GEORGETOWN CMS	GEORGETOWN	0.002	0.010	0.010	0	0.038	0.038	0	0.063
45-045-0008	GREENVILLE	371736	3855846	GREENVILLE HEALTH DEPT.	GREENVILLE	0.000	0.013	0.011	0	0.035	0.025	0	0.041
45-063-0008	LEXINGTON	485720	3767608	SEVEN OAKS RECREATIONAL CTR.	IRMO	0.003	0.015	0.014	0	0.072	0.056	0	0.119
45-073-0001	OCONEE	295318	3853504	ROUND MT. FIRE TOWER (LONG CREEK)		0.002	0.014	0.009	0	0.027	0.021	0	0.030
45-079-0007	RICHLAND	503485	3772372	PARKLANE - STATE PARK HEALTH CTR.	COLUMBIA	0.003	0.011	0.010	0	0.028	0.020	0	0.040
45-079-0021	RICHLAND	520258	3741410	CONGAREE BLUFF		0.002	0.010	0.009	0	0.048	0.035	0	0.074
45-079-1003	RICHLAND	496666	3764672	SCDHEC PARKING LOT	COLUMBIA	0.003	0.018	0.009	0	0.035	0.028	0	0.055
45-079-1006	RICHLAND	516067	3741587	CONGAREE SWAMP NATIONAL MONUMENT		0.002	0.009	0.008	0	0.029	0.026	0	0.043
ANNUAL STATE WIDE AVERAGE =>						0.002			0			0	
STATE WIDE MAXIMUMS =>							0.018	0.015		0.048	0.044		0.119

Background Concentrations for Modeling Purposes:*

Sulfur Dioxide (SO_2) - $\mu g/m^3$

[Air quality standard = 80 $\mu g/m^3$ Annual, 365 $\mu g/m^3$ 24hr, 1300 $\mu g/m^3$ 3hr]

						ANNUAL	MAX 24HR		MAX 3HR	
SITE ID	COUNTY	UTM-E	UTM-N	SITE NAME	CITY	MEAN	1ST	2ND	1ST	2ND
45-011-0001	BARNWELL	456692	3686698	BARNWELL CMS		5.26	18.4	18.4	57.9	55.3
45-019-0003	CHARLESTON	595649	3638503	JENKINS AV. FIRE STATION	NORTH CHARLESTON	7.90	42.1	34.2	115.8	89.5
45-019-0046	CHARLESTON	625554	3645337	CAPE ROMAIN WILDLIFE REFUGE		5.26	23.7	23.7	71.1	63.2
45-043-0006	GEORGETOWN	658711	3692520	GEORGETOWN CMS	GEORGETOWN	5.26	26.3	26.3	100.0	100.0
45-045-0008	GREENVILLE	371736	3855846	GREENVILLE HEALTH DEPT.	GREENVILLE	0.00	34.2	29.0	92.1	65.8
45-063-0008	LEXINGTON	485720	3767608	SEVEN OAKS RECREATIONAL CTR.	IRMO	7.90	39.5	36.8	189.5	147.4
45-073-0001	OCONEE	295318	3853504	ROUND MT. FIRE TOWER (LONG CREEK)		5.26	36.8	23.7	71.1	55.3
45-079-0007	RICHLAND	503485	3772372	PARKLANE - STATE PARK HEALTH CTR.	COLUMBIA	7.90	29.0	26.3	73.7	52.6
45-079-0021	RICHLAND	520258	3741410	CONGAREE BLUFF		5.26	26.3	23.7	126.3	92.1
45-079-1003	RICHLAND	496666	3764672	SCDHEC PARKING LOT	COLUMBIA	7.90	47.4	23.7	92.1	73.7
45-079-1006	RICHLAND	516067	3741587	CONGAREE SWAMP NATIONAL MONUMENT		5.26	23.7	21.1	76.3	68.4

*The ppm concentrations were converted to μg/m concentrations, using the SO_2 conversion factor μg/m = 2632 * ppm, to obtain backgound concentrations used in air dispersion modeling analyses.

Nitrogen Dioxide (NO_2) - ppm

[Air quality standard = 0.053 ppm Annual Mean]

SITE ID	COUNTY	UTM-E	UTM-N	SITE NAME	CITY	ANNUAL MEAN	MAX 1HR 1ST	MAX 1HR 2ND	OBSV	% Complete
45-003-0003	AIKEN	417056	3699183	JACKSON MIDDLE SCHOOL		0.005	0.042	0.037	6628	75%
45-011-0001	BARNWELL	456692	3686698	BARNWELL CMS		0.004	0.028	0.026	6619	75%
45-019-0003	CHARLESTON	595649	3638503	JENKINS AV. FIRE STATION	NORTH CHARLESTON	0.011	0.063	0.061	8517	97%
45-019-0046	CHARLESTON	625554	3645337	CAPE ROMAIN WILDLIFE REFUGE		0.007	0.030	0.028	8305	95%
45-045-0008	GREENVILLE	371736	3855846	GREENVILLE HEALTH DEPT	GREENVILLE	0.016	0.075	0.065	8240	94%
45-045-0009	GREENVILLE	380028	3862420	TAYLORS	TAYLORS	0.013	0.059	0.059	4046	95%
45-079-0007	RICHLAND	503485	3772372	PARKLANE - STATE PARK HEALTH CTR	COLUMBIA	0.014	0.072	0.068	7993	91%
45-079-0021	RICHLAND	520258	3741410	CONGAREE BLUFF		0.004	0.044	0.042	7827	93%
45-079-1006	RICHLAND	516067	3741587	CONGAREE SWAMP NATIONAL MONUMENT		0.003	0.021	0.017	3018	43%
ANNUAL STATE WIDE AVERAGE =>						0.009			6799	86.8%
STATE WIDE MAXIMUMS =>							0.075	0.072		

Background Concentrations for Modeling Purposes:*

Nitrogen Dioxide (NO_2) - $\mu g/m^3$

[Air quality standard = 100 $\mu g/m^3$ Annual Mean]

SITE ID	COUNTY	UTM-E	UTM-N	SITE NAME	CITY	ANNUAL MEAN
45-003-0003	AIKEN	417056	3699183	JACKSON MIDDLE SCHOOL		9.44
45-011-0001	BARNWELL	456692	3686698	BARNWELL CMS		7.55
45-019-0003	CHARLESTON	595649	3638503	JENKINS AV. FIRE STATION	NORTH CHARLESTON	20.8
45-019-0046	CHARLESTON	625554	3645337	CAPE ROMAIN WILDLIFE REFUGE		13.2
45-045-0008	GREENVILLE	371736	3855846	GREENVILLE HEALTH DEPT	GREENVILLE	30.2
45-045-0009	GREENVILLE	380028	3862420	TAYLORS	TAYLORS	24.5
45-079-0007	RICHLAND	503485	3772372	PARKLANE - STATE PARK HEALTH CTR	COLUMBIA	26.4
45-079-0021	RICHLAND	520258	3741410	CONGAREE BLUFF		7.55
45-079-1006	RICHLAND	516067	3741587	CONGAREE SWAMP NATIONAL MONUMENT		5.66

*The ppm concentrations were converted to g/m concentrations, using the NO_2 conversion factor g/m = 1887 * ppm, to obtain backgound concentrations used in air dispersion modeling analyses.

Acid Rain

SITE ID	COUNTY	UTM-E	UTM-N	SITE NAME	CITY	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	PERIOD AVERAGE
45-001-0001	ABBEVILLE	372478	3798898	DUE WEST		4.27	4.44	4.34	4.49	4.57	4.48	4.56	4.52	4.28	4.60	4.46
45-011-0001	BARNWELL	456692	3686698	BARNWELL CMS		4.35	4.39	4.38	4.60	4.63	4.52	4.61	4.61	4.41	4.67	4.52
45-019-0046	CHARLESTON	625554	3645337	CAPE ROMAIN WILDLIFE REFUGE		4.37	4.43	4.06	4.69	4.46	4.57	4.57	4.61	4.41	4.57	4.47
45-021-0002	CHEROKEE	425619	3887598	COWPENS NATIONAL BATTLE GROUND		4.27	4.30	4.26	4.35	4.45	4.37	4.41	4.38	4.15	4.57	4.35
45-073-0001	OCONEE	295318	3853504	ROUND MT. FIRE TOWER (LONG CREEK)		4.27	4.42	4.28	4.51	4.60	4.43	4.53	4.59	4.29	4.57	4.45
45-079-0007	RICHLAND	503485	3772372	PARKLANE - STATE PARK HEALTH CTR	COLUMBIA	4.30	4.28	4.28	4.54	4.49	4.53	\\	4.63	4.37	4.65	4.45
45-079-1006*	RICHLAND	516067	3741587	CONGAREE SWAMP NATIONAL MONUMENT		4.33	4.44	4.26	4.59	4.58	4.52	4.47	4.64	4.25	4.48	4.46
45-079-0021*	RICHLAND	520258	3741410	CONGAREE BLUFF		\\	\\	\\	\\	\\	\\	\\	\\	\\	4.55	4.55
45-087-0001	UNION	448587	3821887	DELTA		4.36	4.39	4.33	4.54	4.52	4.51	4.50	4.57	4.15	4.60	4.45
ANNUAL STATE WIDE AVERAGE =>						4.32	4.39	4.28	4.54	4.54	4.49	4.52	4.57	4.29	4.58	

*Relocated from CONGAREE SWAMP to CONGAREE BLUFF February, 2000

Ozone (O_3) - ppm
[Air quality standard = 0.125 ppm 1hr Daily Max]

SITE ID	COUNTY	UTM-E	UTM-N	SITE NAME	CITY	MAX 1HR 1ST	2ND	3RD	4TH	OBS> .124	OBSV.	% Complete
45-001-0001	ABBEVILLE	372478	3798898	DUE WEST		0.104	0.096	0.094	0.093	0	220	98%
45-003-0003	AIKEN	426614	3689312	JACKSON MIDDLE SCHOOL		0.122	0.110	0.106	0.103	0	215	91%
45-003-0004	AIKEN			WAGENER DOT		0.091	0.087	0.083	0.082	0	134	92%
45-007-0003	ANDERSON	363630	3848907	POWDERSVILLE		0.109	0.103	0.096	0.093	0	310	97%
45-011-0001	BARNWELL	456692	3686698	BARNWELL CMS		0.112	0.106	0.104	0.101	0	305	83%
45-015-0002	BERKELEY	599351	3650181	BUSHY PARK PUMP		0.107	0.093	0.089	0.087	0	268	94%
45-019-0042	CHARLESTON	596762	3641594	U S ARMY RESERVE		0.106	0.105	0.100	0.099	0	280	91%
45-019-0046	CHARLESTON	625554	3645337	CAPE ROMAIN WILDLIFE REFUGE		0.107	0.101	0.096	0.089	0	344	94%
45-021-0002	CHEROKEE	425619	3887598	COWPENS NATIONAL BATTLE GROUND		0.116	0.115	0.101	0.101	0	314	98%
45-023-0002	CHESTER	481373	3849885	CHESTER AIRPORT		0.095	0.094	0.094	0.092	0	225	96%
45-029-0002	COLLETON	503269	3651959	ASHTON		0.103	0.096	0.091	0.087	0	230	96%
45-031-0003	DARLINGTON	615539	3794336	PEE DEE EXP. STATION		0.105	0.105	0.104	0.095	0	341	93%
45-037-0001	EDGEFIELD	420928	3733431	TRENTON		0.093	0.092	0.091	0.090	0	357	98%
45-045-0009	GREENVILLE	380028	3862420	TAYLORS	TAYLORS	0.129	0.096	0.095	0.094	1	79	95%
45-073-0001	OCONEE	295318	3853504	ROUND MT. FIRE TOWER (LONG CREEK)		0.098	0.095	0.091	0.091	0	302	83%
45-077-0002	PICKENS	331505	3835941	CLEMSON CMS	CLEMSON	0.105	0.096	0.093	0.093	0	220	75%
45-079-0007	RICHLAND	503485	3772372	PARKLANE - STATE PARK HEALTH CTR	COLUMBIA	0.114	0.113	0.112	0.101	0	308	99%
45-079-0021	RICHLAND	520258	3741410	CONGAREE BLUFF		0.107	0.095	0.093	0.089	0	285	98%
45-079-1002	RICHLAND	511449	3776444	SANDHILL		0.120	0.117	0.116	0.105	0	362	99%
45-079-1006	RICHLAND	516067	3741587	CONGAREE SWAMP NATIONAL MONUMENT		0.091	0.088	0.087	0.085	0	258	88%
45-083-0009	SPARTANBURG	401836	3872111	NORTH SPARTANBURG FIRE STATION		0.123	0.110	0.105	0.103	0	277	97%
45-087-0001	UNION	448587	3821887	DELTA		0.096	0.093	0.089	0.088	0	356	98%
45-089-0001	WILLIAMSBURG	632955	3732242	INDIANTOWN		0.095	0.092	0.088	0.083	0	222	99%
45-091-0006	YORK	479147	3865723	YORK CMS		0.093	0.089	0.088	0.087	0	213	93%
ANNUAL STATE WIDE AVERAGE =>										0	268	93.5%
STATE WIDE MAXIMUMS =>						0.129	0.123	0.122	0.120			

[Air quality standard = 0.085 ppm 8hr Daily Average Max]

SITE ID	COUNTY	UTM-E	UTM-N	SITE NAME	CITY	MAX 8HR 1ST	2ND	3RD	4TH	OBS> .084	OBSV.	% Complete
45-001-0001	ABBEVILLE	372478	3798898	DUE WEST		0.089	0.089	0.086	0.085	4	5277	98%
45-003-0003	AIKEN	426614	3689312	JACKSON MIDDLE SCHOOL		0.104	0.097	0.094	0.094	10	5147	91%
45-003-0004	AIKEN			WAGENER DOT		0.083	0.077	0.077	0.075	0	3215	92%
45-007-0003	ANDERSON	363630	3848907	POWDERSVILLE		0.102	0.087	0.087	0.086	5	7417	97%
45-011-0001	BARNWELL	456692	3686698	BARNWELL CMS		0.099	0.093	0.091	0.090	8	7306	83%
45-015-0002	BERKELEY	599351	3650181	BUSHY PARK PUMP		0.089	0.089	0.082	0.080	2	6419	94%
45-019-0042	CHARLESTON	596762	3641594	U S ARMY RESERVE		0.095	0.087	0.085	0.082	3	6704	91%
45-019-0046	CHARLESTON	625554	3645337	CAPE ROMAIN WILDLIFE REFUGE		0.095	0.087	0.080	0.076	2	8252	94%
45-021-0002	CHEROKEE	425619	3887598	COWPENS NATIONAL BATTLE GROUND		0.103	0.094	0.092	0.088	3	7534	98%
45-023-0002	CHESTER	481373	3849885	CHESTER AIRPORT		0.085	0.080	0.080	0.078	1	5396	96%
45-029-0002	COLLETON	503269	3651959	ASHTON		0.097	0.084	0.082	0.080	1	5505	96%
45-031-0003	DARLINGTON	615539	3794336	PEE DEE EXP. STATION		0.100	0.095	0.090	0.087	4	8172	93%
45-037-0001	EDGEFIELD	420928	3733431	TRENTON		0.087	0.085	0.081	0.079	2	8553	97%
45-045-0009	GREENVILLE	380028	3862420	TAYLORS	TAYLORS	0.104	0.085	0.083	0.081	2	1874	94%
45-073-0001	OCONEE	295318	3853504	ROUND MT. FIRE TOWER (LONG CREEK)		0.086	0.085	0.082	0.081	2	7238	82%
45-077-0002	PICKENS	331505	3835941	CLEMSON CMS	CLEMSON	0.095	0.088	0.081	0.081	2	5269	98%
45-079-0007	RICHLAND	503485	3772372	PARKLANE - STATE PARK HEALTH CTR	COLUMBIA	0.100	0.099	0.096	0.096	8	7378	99%
45-079-0021	RICHLAND	520258	3741410	CONGAREE BLUFF		0.091	0.080	0.080	0.076	1	6831	98%
45-079-1002	RICHLAND	511449	3776444	SANDHILL		0.102	0.100	0.098	0.097	7	8682	99%
45-079-1006	RICHLAND	516067	3741587	CONGAREE SWAMP NATIONAL MONUMENT		0.076	0.075	0.074	0.073	0	6176	88%
45-083-0009	SPARTANBURG	401836	3872111	NORTH SPARTANBURG FIRE STATION		0.100	0.097	0.091	0.089	8	6690	97%
45-087-0001	UNION	448587	3821887	DELTA		0.087	0.083	0.079	0.079	1	8531	97%
45-089-0001	WILLIAMSBURG	632955	3732242	INDIANTOWN		0.082	0.081	0.077	0.077	0	5316	98%
45-091-0006	YORK	479147	3865723	YORK CMS		0.076	0.076	0.076	0.076	0	5110	93%
ANNUAL STATE WIDE AVERAGE =>										3	6416	94.1%
STATE WIDE MAXIMUMS =>						0.104	0.104	0.103	0.102			

Particulate Matter (PM_{10}) - μ g/m³

[Air quality standard = 50 μ g/m³ Annual Mean, 150 μ g/m³ 24hr]

SITE ID	COUNTY	UTM-E	UTM-N	SITE NAME	CITY	WTD ARITH MEAN	1ST MAX	2ND MAX	3RD MAX	4TH MAX	OBS> 150	OBSV	% Complete
45-003-0003	AIKEN	426614	3689312	JACKSON MIDDLE SCHOOL		21	39	34	34	32	0	55	90%
45-011-0001	BARNWELL	456692	3686698	BARNWELL CMS		21	126	42	36	35	0	57	93%
45-019-0003*	CHARLESTON	595649	3638503	JENKINS AV. FIRE STATION	NORTH CHARLESTON	22	56	52	51	51	0	290	79%
45-019-0046	CHARLESTON	625554	3645337	CAPE ROMAIN WILDLIFE REFUGE		18	37	35	33	31	0	57	93%
45-019-0047	CHARLESTON	598473	3634157	U S NAVAL BASE	NORTH CHARLESTON	23	46	45	42	41	0	59	97%
45-039-8001	FAIRFIELD	508081	3791655	RIDGEWAY #1		20	38	33	30	30	0	51	84%
45-039-8002	FAIRFIELD	511046	3792767	RIDGEWAY #2		23	68	40	40	39	0	56	92%
45-043-0002	GEORGETOWN	658389	3693255	HOWARD HIGH SCHOOL	GEORGETOWN	30	87	62	58	57	0	58	95%
45-043-0006*	GEORGETOWN	658711	3692520	GEORGETOWN CMS	GEORGETOWN	33	85	72	71	69	0	365	100%
45-043-0009	GEORGETOWN	659490	3693858	WINYAH	GEORGETOWN	29	82	66	54	53	0	60	98%
45-045-1002*	GREENVILLE	370287	3859348	PARKER FIRE STATION	GREENVILLE	25	56	54	52	51	0	202	55%
45-063-0005	LEXINGTON	488916	3738007	SALTECH		22	47	43	38	37	0	57	93%
45-063-0009*	LEXINGTON	495150	3759006	CAYCE CMS	CAYCE	46	148	132	123	123	0	338	92%
45-079-0007	RICHLAND	503485	3772372	PARKLANE	COLUMBIA	22	40	36	34	34	0	55	90%
45-079-0014	RICHLAND	498204	3760083	ENRIGHT (REX) ATHLETIC CENTER	COLUMBIA	23	38	26	21	19	0	5	100%
45-079-0018*	RICHLAND	496305	3759991	OLYMPIA	COLUMBIA	36	157	109	95	87	1	256	70%
45-079-0019	RICHLAND	497794	3761007	BATES HOUSE (USC)	COLUMBIA	26	57	47	40	39	0	56	100%
45-079-1003	RICHLAND	496666	3764672	SCDHEC PARKING LOT	COLUMBIA	23	45	40	37	36	0	59	97%
45-083-0001	SPARTANBURG	414850	3867421	SPARTANBURG CITY HALL	SPARTANBURG	24	49	44	43	43	0	55	90%
45-091-0005	YORK	499924	3868718	ROCK HILL WATER FILTER PLANT	ROCK HILL	28	73	46	45	44	0	57	93%
ANNUAL STATE WIDE AVERAGE =>						26					0	112	83.8%
STATE WIDE MAXIMUMS =>							157	148	132	126			

* CONTINUOUS MONITOR

EXCEPTIONAL EVENT DATA EXISTS IN AT LEAST ONE OF THE ABOVE SITES, BUT IS NOT INCLUDED IN THE SUMMARY CALCULATIONS.

Particulate Matter ($PM_{2.5}$) - $\mu g/m^3$

[Air quality standard = 15 $\mu g/m^3$ Annual Mean, 65 $\mu g/m^3$ 24hr]

SITE ID	COUNTY	UTM-E	UTM-N	SITE NAME	CITY	MEAN	1ST MAX	2ND MAX	3RD MAX	4TH MAX	OBS> 65	OBSV	% Complete
45-007-0003*	ANDERSON	363630	3848907	POWDERSVILLE		24.3	36.7	35.8	35.5	34.1	0	120	72%
45-013-0007	BEAUFORT	530355	3588470	BEAUFORT KING STREET	BEAUFORT	12.6	32.4	29.7	29.4	28.6	0	111	92%
45-019-0046	CHARLESTON	625554	3645337	CAPE ROMAIN WILDLIFE REFUGE		12.3	34.4	31.5	30.4	30.2	0	100	83%
45-019-0048	CHARLESTON	587347	3649274	CHARLESTON FAA BEACON	CHARLESTON	13.4	44.6	43	40.3	39.3	0	358	98%
45-019-0049	CHARLESTON	597515	3628389	CHARLESTON PUBLIC WORKS	CHARLESTON	13.4	42.3	41.4	41.3	34.5	0	363	99%
45-025-0001	CHESTERFIELD	573287	3830568	CHESTERFIELD		13.5	30.8	26.1	25.1	24.7	0	103	85%
45-029-0002	COLLETON	503269	3651959	ASHTON		11.2	17	14.8	14.3	14.1	0	15	83%
45-037-0001	EDGEFIELD	420928	3733431	TRENTON		14.8	31.5	29.9	28	27.8	0	111	92%
45-041-0002	FLORENCE	605971	3781130	H L SNEED MIDDLE SCHOOL	FLORENCE	14.3	47.3	33.7	31.3	29.6	0	114	94%
45-043-0009	GEORGETOWN	659490	3693858	WINYAH	GEORGETOWN	15.6	36.7	36.4	33.4	33.1	0	107	88%
45-045-0009	GREENVILLE	380028	3862420	TAYLORS	TAYLORS	16.5	51.5	41.3	39.3	39.2	0	317	87%
45-047-0003	GREENWOOD	391936	3786176	MERRYWOOD SCHOOL		15.3	32.2	31.3	29.9	28.2	0	116	96%
45-051-0002	HORRY	697982	3728508	MYRTLE BEACH EQC	MYRTLE BEACH	10.2	12.1	11.4	9	8.3	0	4	100%
45-063-0005	LEXINGTON	488916	3738007	SALTECH		14.4	35.6	29.5	26.5	26.2	0	118	98%
45-063-0008	LEXINGTON	485720	3767608	SEVEN OAKS RECREATIONAL CTR	IRMO	16.3	53.7	37.5	29.2	28.5	0	116	96%
45-073-0001	OCONEE	295318	3853504	ROUND MT. FIRE TOWER (LONG CREEK)		12.7	31.4	31.4	31.2	27.6	0	100	83%
45-079-0007	RICHLAND	503485	3772372	PARKLANE	COLUMBIA	15.4	32.5	31.8	29.8	29.5	0	117	97%
45-079-0018*	RICHLAND	496305	3759991	OLYMPIA	COLUMBIA	19.6	46.6	42.7	42.7	42.4	0	273	75%
45-079-0019	RICHLAND	497794	3761007	BATES HOUSE (USC)	COLUMBIA	16.0	35.6	32.8	31.5	31.1	0	114	94%
45-083-0008*	SPARTANBURG	411757	3859656	ROEBUCK - PECAN		15.9	34.4	32.7	32.1	30.9	0	150	91%
45-083-0010	SPARTANBURG	408207	3865174	WEST VIEW ELEMETARY SCHOOL		15.5	38.6	36.8	36.8	35.1	0	320	87%
45-091-0006	YORK	479147	3865723	YORK CMS		14.6	33.8	32.3	28.9	27.7	0	102	84%
ANNUAL STATE WIDE AVERAGE =>						14.9					0	152	90.5%
STATE WIDE MAXIMUMS =>							53.7	51.5	47.3	46.6			

* CONTINUOUS MONITOR

EXCEPTIONAL EVENT DATA EXISTS IN AT LEAST ONE OF THE ABOVE SITES, BUT IS NOT INCLUDED IN THE SUMMARY CALCULATIONS.

APPENDIX B: GLOSSARY/ACRONYMS

AFV	Alternative Fuel Vehicle
AIRS	Aerometric Information Retrieval System
ALAPCO	Association of Local Air Pollution Control Officials
ALIS	Asbestos Licensing Information System
APDLN	Air Pollution Distance Learning Network
APTI	Air Pollution Training Institute
AQI	Air Quality Index
AQCRs	Air Quality Control Regions
BACT	Best Available Control Technology
BAQ	Bureau of Air Quality
BDT	Best Demonstrated Technology
BTU	British Thermal Unit (mmBTU=one million BTUs)
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CAP	Citizen s Advisory Panel Clean Air Partnership
CAPCA	Carolina Air Pollution Control Association
CARB	California Air Resources Board
CEMS	Continuous Emissions Monitoring Systems
CEP	Cumulative Exposure Project
CFCs	Chlorofluorocarbons
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CTGs	Control Technique Guidelines
DASM	District Air Section Manager
DASP	District Air Section Personnel
ECOS	Environmental Council of States
EFIS	Environmental Facilities Information System
EPA	Environmental Protection Agency
ERP	Early Reductions Program
FHA	Federal Highway Administration
FIP	Federal Implementation Plan
FTA	Federal Transit Administration
HAPs	Hazardous Air Pollutants
HDDEM	Heavy Duty Diesel Engine Manufacturer
HON	Hazardous Organic NESHAP
IAQ	Indoor Air Quality
LAER	Lowest Achievable Emission Rate
LEV	Low Emission Vehicle
MAAC	Maximum Allowable Ambient Concentration
MACT	Maximum Achievable Control Technology
MOU	Memorandum of Understanding
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NAICS	North American Industrial Classification System
NAMS	National Air Monitoring Stations
NARS	National Asbestos Registry System
NATA	National Air Toxics Assessment
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NETI	National Enforcement Training Institute
NO_x	Oxides of Nitrogen
NSPS	New Source Performance Standards
NSR	New Source Review
NTI	National Toxics Inventory
O_3	Ozone
OTAG	Ozone Transport Assessment Group
Pb	Lead
PCA	Pollution Control Act
PM (or PT)	Particulate Matter
PSD	Prevention of Significant Deterioration
PSI	Pollutant Standard Index
RACT	Reasonably Available Control Technology

RMP	Risk Management Plan
SAMI	Southern Appalachian Mountains Initiative
SARA	Superfund Amendments and Reauthorization Act
SBAP	Small Business Assistance Program
SCR	Selective Catalytic Reduction
SC DHEC	South Carolina Department of Health and Environmental Control
SESARM	Southeastern States Air Resource Managers
SI	Self Instruction
SIC	Standard Industrial Classification (Codes)
SIP	State Implementation Plan
SLAMS	State and Local Air Monitoring Stations
SO_x	Sulfur Oxides
STAPPA	State and Territorial Air Pollution Program Administrators
TAPs	Toxic Air Pollutants
TCM	Transportation Control Measures
TEA-21	Transportation Equity Act for the 21st Century
TLVs	Threshold Limit Values
TPY	Tons Per Year
TRI	Toxic Release Inventory
TSP	Total Suspended Particulate
VISTAS	Visibility Improvement–State and Tribal Association of the Southeast
VOC	Volatile Organic Compounds

APPENDIX C: TERMS/DEFINITIONS

The following terms are necessarily general and are offered for educational purposes only. This information should not be relied upon for decisions or determinations regarding permitting, compliance, or any other activities.

Acid Rain: Snow, sleet, hail, rain, or fog that has a low pH resulting from pollutants in the air, especially sulfur dioxide and nitrogen oxides.

Air Shed: The geographic region that shares an air supply.

Air Pollution: The contamination of the atmosphere by pollutants from industry, fuel exhaust, and other pollution-creating processes.

Air Quality Index: A guide used to show the amount of certain air pollutants in the outside air and that provides information about possible health effects.

Air Quality Monitoring: Observation or testing to measure pollutants in the outdoor air.

Air Quality Standards: The maximum concentration of pollutants allowed by laws or regulations during a specified time in a defined area.

Ambient Air: Outside air.

Area Source: A source of air pollution not emitted from industrial stacks or vents. For example, fireplaces, wood stoves, and gas-powered lawn equipment.

Biogenic Emissions: Air pollution from natural sources such as trees, shrubs, and other vegetation.

Catalytic Converter: A device used to reduce air pollution from vehicle exhaust.

Chlorofluorocarbons (CFCs): chemicals used as coolants for refrigeration and air conditioning as well as in some consumer products like aerosol hairspray. These chemicals are harmful to the *ozone layer*.

Clean Air Act: The legislation, originally enacted in 1963, revised in 1970, 1977, and amended in 1990, that is the basis for the national air pollution control program.

Clean Fuels: Low-pollution fuels like ethanol or compressed natural gas (CNG) that can replace traditional fuels.

Climate: Weather conditions such as temperature, precipitation, and wind that are typical in an area or region over time.

Combustion: Burning of coal, wood, or other material accompanied by release of energy in the form of heat and light; a major contributor to air pollution.

Compliance: The full implementation and observance of state and federal requirements, standards, and regulations.

Criteria Pollutants: Pollutants for which there is a *National Ambient Air Quality Standard* (NAAQS). These pollutants include ozone, lead, particulate matter, nitrogen dioxide, sulfur dioxide, and carbon monoxide.

South Carolina Department of Health and Environmental Control (SC DHEC): SC DHEC was created in 1973 when the State Board of Health and the Pollution Control Authority merged. SC DHEC is responsible for protecting the state's environment and the health of all South Carolinians.

Emissions: Discharges into the atmosphere from sources such as industrial stacks or vents; from residential chimneys; and from motor vehicles, locomotive, and aircraft exhaust.

Environmental Protection Agency (EPA): The EPA was created in 1970 to set policy and guidelines and to carry out legal mandates to protect environmental resources at the national level.

Fossil Fuels: A combustible material such as coal, petroleum, or natural gas.

Greenhouse Effect: The trapping of heat on the surface of the earth.

Inversion: In the atmosphere, a layer of warm air that lies over a cooler air mass. An inversion traps pollutants close to the earth's surface.

Meteorology: Science that deals with the atmosphere and physical processes that cause weather patterns.

National Ambient Air Quality Standards (NAAQS): Laws or regulations which establish the concentration limits for criteria pollutants in the outside air.

Non-attainment Area: A region or area that fails to meet the standards for one or more of the criteria pollutants.

Open Burning: The burning of any material in an open fire or an outdoor container when specifically designed equipment is not used to control the combustion of air pollution from the fire.

Ozone: A very reactive molecule made up of three oxygen atoms. Ozone can either be good or bad, depending on where it is. *Ground-level ozone* occurs near the earth's surface in the troposphere and is harmful to our lungs and to the environment. The *ozone layer*, 10-35 miles above the earth's surface in the stratosphere, protects us from the sun's harmful rays.

Particulate Matter: Small solid particles, like dust, or liquid droplets that are suspended in the air.

Plume: Visible emissions from a smokestack or chimney.

Smog: A mixture of air pollution, including ground-level ozone, produced by chemical reactions in the air. Smog can harm health, damage the environment, and cause poor visibility.

Stationary (or Point) Source: A non-mobile source of air pollution, such as a power plant or manufacturing facility that emits air pollution.

Sensitive Groups: Those who are at greater risk from the harmful effects of air pollution, like children and people with respiratory diseases such as asthma, chronic bronchitis, and emphysema.

Toxic Release Inventory (TRI): Information from industries about releases of toxic substances above a specified quality into the environment.

APPENDIX D: EQC DISTRICT OFFICES

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